Proceedings

Eleventh Annual
Reciprocal Meat Conference

Chicago, Illinois
June 16, 17, 18, 19, 1958

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PROCEEDINGS
of
ELEVENTH ANNUAL RECIPROCAL MEAT CONFERENCE

JUNE 16-17, 1958

MORRISON HOTEL

CHICAGO, ILLINOIS

TABLE OF CONTENTS

MONDAY MORNING SESSION
June 16, 1958

Page

Opening of Program 1

Welcome, Carl F. Neumann 1

Presentation of gavel 2

Meat Processing Committee:

Introduction, W. L. Sulzbacher 2

A Review of the Chemistry and Physiology of Tissue Fats, M. C. Brockmann 5

Lard Rendering by the American Meat Packer, John E. Thompson 10

Discussion 17

Chemistry of Food Uses of Meat Fats, C. E. Swift 21

Discussion 25

Non-Food Uses of Meat Fats, O. H. M. Wilder 27

Discussion, W. L. Sulzbacher 30

Meat Judging Manual and Contest Committee:

Minutes of Meat Judging Coaches' Meeting, R. J. Deans 32

Live Animal Evaluation Clinics and Meat Judging Handbook, K. R. Franklin 35

Discussion 37

(PROCEEDINGS - Cont'd)

Page

Roll Call 42

MONDAY AFTERNOON SESSION
June 16, 1958

Extension and Consumer Education Committee:

Developmental Aspects of Cooperative Programming,
A. R. Ring, Jr. 46

Broadening the Scope of Effectual Meat Education,
Moreland Martin 50

Discussion 54

Research Review Committee:

Progress Report on Abstracting,
A. Z. Palmer 61

Discussion 62

Research Methods Committee:

Meat Enzymes,
R. A. Sliwinski 79

Panel Discussion:

J. Kastelic 86
A. M. Pearson 88
B. S. Schweigert 90

Discussion 92

Personnel Committee:

Report of the Year's Activities,
L. E. Kunkle 95

Election of Executive Committee 96
114

Membership Policy Committee 98

Progress report and discussion,
R. W. Bray 99

Invitations for 1959 Conference city 105

Page

TUESDAY MORNING SESSION
June 17, 1958

Lamb, Veal and Calf Carcass Evaluation Committee:

A National Lamb Promotion Program,
Dick Biglin 116

The Kentucky Lamb Promotion Program,
James D. Kemp 124

Discussion 127

Effects of Recent Changes in Lamb Carcass Grading on Carcass Acceptance and Lamb Production:

Summary of changes, Ned Tyler 129

The Producer's Viewpoint, C. O. Schoonover 131

The Lamb Feeder's Viewpoint, G. R. Johnson 133

Discussion 138

Consumer Research Committee:

The Missouri Conference on Consumer Studies and Meat Quality:

The Economist's Viewpoint, V. James Rhodes 141

The Technologist's Viewpoint, L. J. Bratzler 151

Discussion 154

Election of Chairman 162

Teaching Committee:

An Off-Campus Meat Course,
David L. Mackintosh 164

Survey of College Meat Courses,
H. D. Naumann 169

Discussion 171

(PROCEEDINGS - Cont'd)

Page

TUESDAY AFTERNOON SESSION
June 17, 1958

Pork Carcass Evaluation Committee:

Evaluation of Meat-Type Hog:

Role of Swine Evaluation Stations,
W. J. Aunan 176

Meat-Type Hog Program in Canada,
R. H. Ingram 180

Meat-Type Hog Program in Denmark,
F. G. Ketner 189

Discussion 195

Beef Carcass Evaluation Committee:

The Effect of Breeding and Production on Beef Carcass Characteristics,
E. J. Warwick 201

The Relationship of Bone to Muscle in Beef Carcasses,
L. D. Wythe 209

An Approach to Measuring Beef Tenderness,
Sylvia Cover 217

Discussion 221

Business Meeting:

Discussion and selection of 1959 Conference city 228

Report of Resolutions Committee 229

Report of Treasurer 231

Further discussion on selection of 1959 Conference city 232

Installation of new Chairman 237

Syllabus of a Basic Meats Course for Animal Husbandry or Animal Science Students 240

PROCEEDINGS

ELEVENTH ANNUAL RECIPROCAL MEAT CONFERENCE

MONDAY MORNING SESSION

JUNE 16, 1958

The opening session of the Eleventh Annual Reciprocal Meat Conference, held at the Morrison Hotel, Chicago, Illinois, June 16-19, 1958, was called to order at 8:40 o'clock, by Mr. V. R. Cahill, Ohio State University, Chairman.

CHAIRMAN CAHILL: I wish to call this 1958 Reciprocal Meat Conference to order and to extend to each of you a personal welcome. Your presence here indicates to me that this is going to be both a profitable and an enjoyable experience for the next two days.

We are cognizant of the fact that our sponsoring organization, the National Live Stock and Meat Board, has been very active again this year with both financial and mental help. I think it is quite appropriate at this time that we hear a few words of wisdom from the Secretary and General Manager, Mr. Carl F. Newmann. Carl.

MR. CARL F. NEWMANN: Vern, thank you.

It's a pleasure, of course, for us to have the opportunity again to extend a welcome to you here on your Eleventh Annual Reciprocal Meat Conference. We should like you to know that the Board's thirty directors consider the Board's minor association with your activities one of its chief functions through the year. No question is ever raised as to our participation in the work of your group. Personally I have said a good many times and I believe that there is no other group in agriculture in which there is a segment of the teaching and research field that has quite the relationship that the members of the Reciprocal Meat Conference - the teachers in the land grant colleges, the deans, the Quartermaster Corps, the American Meat Institute -- there is no relationship of this kind in all of agriculture that can be compared with the relationship that you in the teaching and research field have with all the segments of the industry, and you have this relationship in spite of the fact that you haven't had, as has been the case, I am sure, on many of your campuses in fields outside the field of agriculture, recruiting programs of personnel and scholarship funds that people have difficulty in placing -- you have built a program without all of those stumbling blocks in your way. This speaks well for you.

I am sure that you will have another good conference. Good luck to you. It is nice of you to have taken this time to listen to me this morning. (Applause)

CHAIRMAN CAHILL: Thank you, Carl. We are greatly appreciative of your activities and those of the Board. I think it is a challenge to us to live up to the expectations which you have of us.

Now we will move along with the program.

The Executive Committee has been prodded from time to time not only this year, but I understand in former years, about the meeting place of this Conference. This year we asked Mr. Neumann and his organization what their feeling is, and they indicated they were heartily in agreement with any idea or thinking of perhaps moving away from Chicago for an occasional conference. So with that in mind we circulated a couple of letters to you folks in the past two or three months. The response to them has been rather unusual and unexpected. We have here the letters of invitation that have come from some 17 institutions together with the literature from them. We have been asked by some of the representatives if they might extend verbal invitations. So the Executive Committee has chosen to extend our meeting this afternoon by setting 4:45 as the time when we might take 15 or 20 minutes and permit verbal invitations from any representatives of institutions who might want to extend invitations. We mention this now so that you can pick your spokesman and help him to condense his invitation to a minute, which will make it necessary to take no more than 15 or 20 minutes for this part of the program.

As I looked through the program I saw that some very fine ideas had been lined up by our various committees. I think they have done an excellent job in formulating the program. As we move to the various committee reports, we are going to ask that the speakers for the committees move forward so that they will be on hand when their time comes. I believe that the chairmen of the committees are going to tell Mrs. Caplin, who is with us again this year, who have papers to hand to her so that she will not need to take them down.

I suspect I need not say that styles have changed a lot in Chicago since we were here a year ago. There is one style, however, that has not changed; that is that the Reciprocal Meat Conference always goes on schedule. So if we may call on Mr. Bill Sulzbacher and the other members who are going to participate in the Meat Processing Committee's report to come forward we will turn the program over to them.

SECRETARY-TREASURER FRANKLIN: Mr. Chairman, since you have brought up the subject of keeping the Conference on schedule, as you know, the past few years it has been the practice of the Conference to award the Chairman a gavel for judicious use. We take pleasure in giving you this gavel. We hope that you will use it firmly and that you will stay with your schedule.

CHAIRMAN CAHILL: Thank you, Ken. I am sincerely grateful to the National Live Stock and Meat Board for this recognition. The gavel and engraving will be a cherished reminder of these pleasant experiences and associations.

Mr. Bill Sulzbacher, of the U.S.D.A., who is chairman of the Meat Processing Committee.

MR. W. L. SULZBACHER: Thank you, Vern.

We are still waiting for one of our participants; so I will delay introduction of individual members until the time arrives for them to speak.

Any person who has ever been near a hog cutting line -- and that, of course, includes every person in this room -- couldn't help being impressed by the amount of fat that is being handled by the cutters, and if you stop to think about this you realize that none of this fat, or almost none of it, is consumed in the condition in which it is removed from the animal. Something has to be done with it, and this is, in fact, one of the first areas in which meat processing became an important technological function. I think it would be safe to say that in the early days of meat packing in this country, it was in the processing of meat fats that the technologists, the chemists, or whatever you may call them, first began to play a really important part in the industry.

If you will look over the statistics you will find that lard consumption has gone up and down, but by and large it has stayed pretty much on a level. For instance in the period from 1909 to 1913 when our annual meat consumption was about 151.3 pounds according to the old yearbooks, lard consumption during that period was 11.4 pounds per capita. From 1914 to 1920, which took in pretty much the war years, meat consumption went down. We only consumed about 140 pounds of meat per person but our lard consumption went up a little to 13 pounds. In the comparatively better times of 1921 to 1925 our meat consumption was back up to the nice high level of 153.8 pounds and our lard consumption was also up a little to 14 pounds. If we jump now to more recent times, our meat consumption, you know, was a little low after the second world war but for the last two or three years it has been back to the figure that we liked to read about before 1910, and on the average from 1950 to 1955 we consumed pretty close to 150 pounds of meat and our lard consumption was somewhat under 13 pounds.

But there is a sort of joker in this story. From 1950 to 1955 the consumption of all fats and oils as foods rose steadily and it is still rising, I understand. It went from 42 to 45 pounds during these years, but during this same period lard consumption slowly declined and, in fact, it is still declining somewhat. So that even though we may be slaughtering quite a few hogs and using quite a bit of pork we are not using the lard. We, of course, wonder why this is. The economists and the people concerned with the policy of agriculture worry about it and they give us many explanations. It is not our concern here to deal so much with this, but it would be obvious to any of us that this is the place where the processor has a job to do. He has to make the fat that we produce along with our livestock into something that we will use. There is reason to believe that it may not always be used necessarily as food, but at least we hope it will be used for something and a goodly portion of it will be used for food. So that our program this morning is designed to give us a bird's-eye picture of just how it is that the meat processor does things with fat so that it gets into the channels of trade.

This will be a sort of introductory view. We think that later on, as the short courses that we have sponsored here develop, there may be a short course dealing specifically with this problem and you will get a little more of the practical side of the picture there. We tend, with one exception this morning, to deal more or less with the research that has gone on and the basic science involved.

I should like to make one correction here in the list of committee members given. Mr. Madsen left the American Meat Institute Foundation about the time that this committee was formed last fall, and Carl Brown of the Foundation has replaced him on our committee.

Also while speaking of this I should like to thank all the members of the committee for their tireless help in writing me letters and considering my long letters to them. Particularly I should like to express a word of thanks to Harold Schultz although he is not here to hear it. Harold took this work very seriously. He even took a day off, when he was near Washington, to come out to Beltsville and discuss the program with me.

Now we will start this morning by considering how it is that this fat comes to us, what it is chemically, and this subject is going to be covered by a man who is particularly well suited to do it. You will remember that last year at the Conference we heard a talk by Mr. Steffanson in which he advanced what he called his B. and B. or beef and bourbon idea. The man who will start our program off is very well qualified to speak about the beef and bourbon aspect since when I first met him he was a bourbon producer. In those days he was with a large distillery. I think he made bourbon. At least I know that he used to consume it and I believe that maybe on occasion he still does. Then Mr. Brockmann went to the other side and he got into the meat picture. Mr. Brockmann is now in charge of the animal product work for the Quartermaster Food and Container Institute, and he will review for us the chemistry and physiology of tissue fats.

##########

A REVIEW OF THE CHEMISTRY AND PHYSIOLOGY OF TISSUE FATS

M. C. BROCKMANN

QUARTERMASTER FOOD AND CONTAINER INSTITUTE

Actually we realize that bourbon and beef are by-products of the same underlying grain when we get right down to it. The subject that we have here, the chemistry and physiology of fatty tissues, could very well be the subject of a five-hour one-semester course that any of you might teach. We are trying to go over the highest of high spots in just the matter of 15 minutes here and so to get down to business let us have the first slide, please.

(Slide) This slide was developed merely to emphasize a fact that you already know, namely, that the fats or the triglycerides with which we are dealing are esters of glycerols. Here we see on your left a molecule of glycerol and on your right a molecule of fat or triglyceride, and down below we see the key to the entire picture, namely, the fatty acid. We have a sort of grid of these fatty acids, and in all the cases with which we will be concerned this N is an even number. This is rather interesting in the philosophy of the thing. Why should this N be an even number? We will not go into this now, however. At any rate, water is split out between the fat as hydroxyl and glycerol to give us triglyceride. As an example of a triglyceride let us see the next slide.

(Slide) To add to the over-all joy of the thing, virtually all the triglycerides that we will ever encounter are mixed triglycerides. In fact, throughout the whole of nature with the exception of the spinifex of Australia the triglycerides are mixed. At the top there you have the stearic acid, for the middle carbon there you have oleic acid, and for the lower carbon you have linoleic acid. Now I realize that for people who are not regularly working with fatty acids these names come rather fast and actually it is very difficult to keep your ears in tune to the difference between oleic acid and linoleic acid. As a consequence we will merely call the acid by the number of carbons it has and by the location of the double bonds. That will simplify matters to a certain extent. In other words, stearic acid is a C18 acid saturate, with no double bonds, and oleic acid is a C18 acid with one double bond between 9 and 10 carbons. We start numbering here from the carbon that is nearest the glycerol. That will be 1. Then 7 more make 8, and the next one is 9. So the double bond there is between carbons 9 and 10. The same way with the linoleic acid at the bottom. There we have two double bonds. That is a C18 acid with two double bonds. As we go a little further into this we will realize that it is these double bonded fatty acids that are the bases of many of our unique problems with animal fats.

Now we have to limit this some way and throughout the animal and vegetable kingdom we have a tremendous number -- not a tremendous number but a relatively large number of fatty acid residues that go into our tryglycerides. As a consequence let us cut this down and consider only the fatty acids that are common to lard and beef tallow.

(Slide) The next slide will give you a rough concept of the most important fatty acids that go into lard and beef fat and a rough idea as to the range in which we find these in these various products. For example, we have in lard a relatively small amount of saturated fatty acid with less than 16 carbons. Actually most of that is with 14 carbons. Then we have the 16 and 18-carbon fatty acids as being the main saturated fatty acid components. On the unsaturated side we have 16, 18 and 20 numbered carbon atoms in the fatty acid molecules with 1, 2, 3 and utimately 4 double bonds. Now we see what this can make for us. This makes this nice simple little problem of just a relatively few fatty acids tremendously complicated because practically all of them are mixed. We have this problem of these fatty acids within the limiting proportions indicated here and we have virtually all combinations of these. In other words, if we consider the breakdown just between saturated and unsaturated, let us say, U stands for unsaturated and S stands for saturated. With our three fatty acids listed there we have a possibility for S, S, S; SSU, SUU and UU as various mixtures between the saturated and the unsaturated fatty acids.

Consider that we have five major unsaturated fatty acids and two or three major sautrated ones and we have the possibility of a tremendous number of these fatty acids, and it is the properties of the fat that result from the presence of these various fatty acids. One exception you might say would be color which is the result of non-fatty material, and another thing is that in a finished solid, lard is perhaps textured which is in great measure due to how fast the fat was cooled and how it was whipped with the gas. Aside from those properties, most of the properties by which we know these fats are the result of these various fatty acids.

(Slide) The next slide will give us a rough idea as to the major tests by which we characterize objectively some of these fatty acids. Let us consider first the melting point. Due to the fact that all of these fatty acids are mixtures, the melting points are very likely to be quite irregular. We find, for example, a surprising difference in beef between the melting point of subcutaneous fat which melts in the vicinity say of 90 to 110 and kidney fat which melts in the neighborhood say of 104 to 122. We find an analogous picture in pork between fatback which melts between 86 and 104 Fahrenheit and leaf fat which melts at 110 to 118 Fahrenheit.

By and large, as a generalization, these unsaturated fatty acids give rise to lower melting point fats. The titer is more or less precisely a matter of the melting points of the mixed fatty acids that we have present in the fat. In other words, we saponify the fat when we react it with a strong alkali to produce the sodium salt of the acid, the glycerol. Then we separate out the free, unsoluble fatty acid and take the melting point on that and that gives us the picture of our titer. By and large our titer runs rather parallel to the hardness or the melting point of the fat.

Another test that we run in order to characterize these fats objectively is the free fatty acids. The free fatty acids to some extent, or perhaps to quite an extent, represent the handling that the fat has received. If the fat has been held at a relatively warm temperature, a relatively satisfactory temperature for enzyme action, the amount of free fatty acid is likely to be quite high. The free fatty acids represent three fat groups that have split off of the glycerole molecule. In the fats which are developed on the killing floor and on the cutting floor that is likely to be quite a problem inasmuch as they must not be held at too high a temperature before they are brought up to a temperature which inactivates the fats because actually with the fat you have a considerable amount of tissue and this tissue contains lipase which hydrolyzes the fat, and some of the tissue, especially pancreatic tissue, is extraordinarily high in lipase and results in a great deal of diluting of fatty acids.

The smoke point is fairly closely related to the fatty acid content. In other words, we would feel that lard can be prepared that can go up, say, to around 400 without serious smoking. On the other hand, if the fat has been mistreated either by overheating or by enzymic splitting the fats will smoke at a much lower temperature and that, in an era of so much deep-fat fried material, is a serious disadvantage to fat.

The iodine value is another measure of the degree of unsaturation of these fats. The more double bonds the more iodine that you will have absorbed, and the iodine value is merely an index of the iodine absorption that you get from double bonds which again are a reflection of the unsaturated aspect of the fat. The iodine value or the unsaturated value of the fat depends to some extent on the diet of the animals. For example, we know that peanut fed hogs tend to have a much softer fat and this is again reflected in the iodine value which runs around 90 to 100, while the iodine value in corn fed hogs runs from 70 to 72 or around that neighborhood.

The peroxide value is an index at least of the start of rancidity. After rancidity progresses beyond a certain point the validity of this index seems to deteriorate a bit but by and large that gives you an idea as to how the fat has started down the road toward rancidity. It is essentially a measure of fat as an oxidizing agent, how much iodine can be liberated from something like potassium iodide which is a property again of the oxygen uptake of the fat.

Then we come lastly to a kind of over-all index which is frequently used to evaluate the stability of fats, namely, this active oxygen method which involves merely putting the fat into a tube and blowing air through it at a prescribed rate. The tube is in a water bath which is held at around 110 centigrade or 100 centigrade. Two temperatures are used, and that is kept up until somebody with a really sensitive nose walks up and smells it and notices that rancidity has started. To be slightly more objective about that you can take the thing off at any prescribed time and run a peroxide value on it which again will reflect the resistance of the fat toward the development of rancidity. From this active oxygen method it is possible to predict with a fair degree of validity the length of time that a fat will stand storage without becoming conspicuously rancid.

Now we have said as yet really nothing about the physiology of fat and, as you realize, fat is primarily a matter of energy storage. Fat represents roughly 9 calories per gram in comparison with carbohydrate and protein which represent around 4 calories per gram. But there is something even more spectacular than that. That is that fat in some of the deposits in animals may run up to 93 or 97 per cent pure fat while protein rarely, if ever, gets over 22 per cent protein and the rest is moisture. But in beef kidney fat, for example, you see the figure of around 94 or 95 per cent pure fat, 2 or 3 per cent water, and 1/2 to 1 per cent protein. Now that represents a highly concentrated reservoir of energy for the animal. Beef brisket fat only runs around 70 per cent fat, around 20 per cent water and, say, 5 per cent protein, a much less concentrated source.

Fat may in certain creatures exposed to environmental stress serve also as padding. It may also serve as insulation against cold stress. We realize that there is a considerable difference between the ability of animals to produce fat. There is a considerable difference between various diets and the type of fat that they produce. We mentioned a while ago that peanut fed hogs have a substantially different fat from corn fed hogs. There is also a difference in the fat that is produced within the tissue of the same animal. The leaf fat in a hog, for example, or the kidney fat in beef tend to run a much higher per cent saturated fats or a much lower per cent unsaturated fatty acid residue than does the subcutaneous fat.

Now the fat is laid down in tissues -- well, the cells resemble very closely undifferentiated fibroblasts. Follow these things histologically and you have a relatively small cell -- I am sorry I don't have a slide to show this -- you have a relatively small cell that develops fatty droplets. You see the formation of fatty droplets. These fatty droplets increase in number and in size. They get bigger and bigger. The cell swells and finally you get a very large, swollen cell which runs a very high per cent fat. Histologically we associate these fats with almost all types of connective tissue, and adipose tissues represent merely those tissues in which we have the highest concentration of these fat depositing cells.

In closing I want to set out one point which I feel would be a very challenging thing for research, and that is we have these fat cells or these connective tissue cells which store fat. The histologists assure us, or at least tell us, that these fats are essentially the same. Actually we find that these cells store considerably different fats. Now what could be the metabolic difference, the difference in mechanism, by which these apparently identical fat cells function in order to produce rather surprisingly different types or percentages of fatty acids?

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MR. SULZBACHER: Thank you, Max.

I should like to warn all of you fellows that this is not the last of the subject that Max has been covering and we will hear more about it before the morning has past. But our thought was that we would follow this procedure: Max would tell us a little about the chemistry of fat, the way in which it is deposited in the animal, and then we would consider how the meat packer or the processor, whoever he might be, gets this fat out of the tissue and into a form acceptable to commerce. My old boss, O. G. Hankins, used to be fond of saying that we are in the research business, and there are also a lot of businesses that are in research.

One of the men in such a business who has to my mind done a very remarkable amount of thinking about this whole subject and has a tremendous grasp of it is John Thompson who is president of the Reliable Packing Company here in Chicago. He has for many years been interested in trying to develop better means by which the packer -- particularly the small packer -- can get his lard out of the fatty tissue and produce it in an economical manner and turn out a product that is superior with respect to some of the qualities that Mr. Brockmann mentioned.

So I think that since many of you people already know John Thompson I will simply now turn the program over to him. I know that he will do a particularly able job in telling you fellows just how this is managed. John, it is all yours. (Applause)

MR. JOHN E. THOMPSON: Thank you, Bill, for that expression of confidence.

Ladies and gentlemen, I realize that you folks are professionals in this meat business. I have no intention here of talking down to you but I am going to warn you now that I intend to paint with a very broad brush, and if there are specific questions later I will make a sincere attempt to answer them for you.

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LARD RENDERING BY THE AMERICAN MEAT PACKER

JOHN E. THOMPSON

RELIABLE MEAT PACKING CO.

In general terms, we are all quite familiar with the process of lard rendering. As with many familiar things, we may not be able to quickly give a good, concise definition. I went to the font of all official definitions:

The Webster International Dictionary gives seventeen different definitions for the word "render". One fits quite well: "To melt down; to extract or clarify by melting; to treat so as to extract the fat." In order to adapt this general definition to the specific process of rendering lard, I propose the following as a working definition for this presentation. "To treat edible, raw pork fatty tissue so as to extract the fat." I will have an addition to this definition to suggest a little later.

Why is Rendering Conducted?

The rendering of animal fat is certainly as old as the meat packing industry. Soon after man discovered the use of fire in the treatment of meat from the hunt, he probably made use of the fat rendered out for preparing other foods. There is the key. When the oil is separated from the fatty tissue it has many additional uses. Also, it will keep, comparatively, much better than the raw fat.

The rendered fats are so broadly useful that it would be very difficult to catalog more than a few of the everyday uses. Consider household frying, commercial and home baking, confection making and deep fat cooking.

Why all the Fuss about Rendering at this Time?

Industrial users of lard found that they could use vegetable oil shortenings to better advantage than lard. Housewives all but forgot how to use lard. The domestic market diminished to bread bakers and only a portion of the pie bakers. Lard was defeated in the market place.

The young, imaginative vegetable oil industry introduced caustic refining, hydrogenation and deodorization. They kept up continuous research and marketing programs.

The older, ponderous, meat packing industry, with many problems other than lard, did not change to meet the new competition rapidly enough.

We managed to get involved in wars often enough to empty out the lard warehouses occasionally. These spurts of demand by munition makers came just often enough to allow meat packers to remain in their lazy, lackadaisical frame of mind.

Finally, after World War II and more definitely after the Korean Conflict, a number of packers evidently decided that they should no longer depend upon wartime demand to clean up the supplies of fats in warehouses. Machinery makers took the initiative to investigate improved methods. Research was at last applied to making lard good enough to compete effectively with the vegetable oil shortenings which only a few years ago were classed as "lard substitutes".

The Principle Methods of Rendering Lard.

The preponderance of lard rendered in American meat packing plants is by one of three principle methods: 1. Prime steam rendering, 2. Open kettle rendering, and 3. Dry rendering. Of these, prime steam rendering accounts for well over half the total volume.

All rendering methods have the one objective of liberating the lard from the cells of the animal fatty tissue. These cells are all closed like a capsule and the oil is inside. The proteinacious cell walls must be broken by heat, chemical or mechanical means. Once the cells are opened, very mild warming to only 110° F. or so will melt the oil and make it free flowing. Basically that is all there is to the rendering process.

Prime Steam Rendering. I have a model here of the basic equipment of a prime steam rendering plant. (Show saucepan) Prime steam rendering is primarily a boiling process in which moist heat is used to denature the protein of the fatty tissue cell walls. Thus weakened, the cell walls break and the lard separates. Part of the protein dissolves in the water and part remains as a rather gelatinous solid. When subsequently dried, the proteinacious solids are known as tankage.

Consider the saucepan expanded in size to accommodate ten to thirty thousand pounds of raw fat and you have the prime steam tank as it is used in a packing house. The heat is supplied by the direct injection of live steam. From this the process gets its name, prime steam rendering.

Most typically a closed tank is used and the operation is conducted under steam pressure so this might be a better model (Show pressure saucepan).

In operation some water is put into the tank. Fat from the hog dressing floor or from the pork cutting department are charged into the tank from the top. Usually the whole chunks are put in without any grinding. When the tank is loaded a pressure tight head is fixed in place and the cooking is started. Temperatures vary from plant to plant. Usually at least 15 pounds pressure and 245° F. is used. After cooking, the load must be settled and cooled to less than 212° F. The lard is then run off.

The tank water may be discarded where sanitary disposal regulations permit or it may be concentrated in steam heated evaporators to give "stick water". The gelatinous solids are dried in another type of steam heated machine to give "tankage". The stick is sometimes added to the dry tankage. Quite an assortment of expensive equipment is required to process the protein residues into salable product after the rendering itself is over.

Since the lard tankage is not used for edible purposes it is frequently combined with the tankage from inedible rendering operations for drying and processing.

The cooking cycle may take nearly 24 hours. In plants with a large daily production of raw fat for rendering, this often makes it necessary to employ a dozen or more cooking tanks.

Open Kettle Rendering. This is probably the simplest of the three common methods. I have here a model of a kettle rendering plant. (Show iron skillet) This skillet and this spoon to stir it are all of the essential features.

Just expand this kettle in your mind's eye to the point where it will hold three to five thousand pounds of raw fat. Put in a mechanical agitator in place of the spoon. Supply the heat by means of a steam jacket. You now have a kettle rendering plant as it is usually found in a packing plant. In practice the raw fats are frequently put through a mincer or sausage grinder before cooking.

In use, the raw fat is charged into the kettle directly from the mincer with the agitator going and the steam applied to the jacket. Steam pressures may vary from 15 to 150 pounds with plant practice. Heat is maintained until substantially all of the moisture is boiled off. The process is essentially frying. After settling, the lard may be drawn off. The dry protein residue is called "cracklings". It is frequently pressed to remove the excess of fat. The pressed cracklings are "meat meal" or "meat scrap".

Dry Rendering. This is really a special type of kettle rendering in which a closed cooker is used. Consider this model. (Show pressure saucepan and spoon) It is a frying process conducted in a closed vessel where either a pressure or vacuum may be applied.

Plant sized cookers are typically of five to ten thousand pound capacity. Usually they are horizontal cylinders with agitator blades that sweep close to the shell wall. Heating is by steam in a jacket. The pressure used varies widely as in open kettle cooking.

Fats are usually charged into the cooker in whole chunks. No water is added and no live steam is injected into the cooker with the fat; hence, the name, dry rendering. The first part of the cooking is done at high temperature by building up a pressure in the cooker just as would occur in the model. This high temperature and the action of the agitator break up the chunks of fat.

After the pieces are well broken up, the steam is vented and cooking is continued until essentially all of the moisture has been evaporated. A vacuum may be applied to the cooker to hasten the boiling and to permit finishing at a lower temperature. A load will take from two to four hours to complete.

The lard is drained away from the crackling and the crackling is pressed to remove most of the excess lard. The pressed crackling from dry rendering may be called "dry rendered tankage" or "meat meal" or "meat scrap".

These three methods, prime steam, kettle rendering, and dry rendering are the main ones in use. Each is typified by the simple kitchen utensil I have shown as a model. The prime steam method is a boiling technique employing pressure cookery to hasten the process. (Show pressure saucepan). The open kettle method is a simple frying process. (Show skillet). The dry rendering method is frying plus the use of pressure cookery to speed things up. (Show pressure fryer). To think of any of these processes as anything more complicated than this is to make the rendering of lard more difficult to understand than is necessary. These simple kitchen pots and pans are capable of producing product identical to that made in their packinghouse sized counterparts.

How do these Methods Compare?

As might be expected, the lard from each of the three methods is slightly different. Because of the water used in prime steam rendering, the lard is washed quite free of non-fat residues. It is usually the lightest in color of any of the three. Generally it has a boiled pork flavor and odor. Because of the high temperature treatment in contact with an excess of water, there is ample opportunity for hydrolysis of the fat. This leads to a higher free fatty acid content.

From either kettle rendering or dry rendering the lard is usually darker and redder in color. This is to be expected from a frying process where local temperatures may become very high. There is no water washing effect as in prime steam rendering. Non-fat materials may dissolve in the lard to some extent. These contribute color, odor and flavor to the lard. The typical flavor and odor of kettle rendered or dry rendered lard is that of fried pork. The average of all kettle rendered lard is darker and of stronger flavor than the average of all dry rendered lard.

If only the rendering process is considered, the prime steam method is very simple; requiring only a pressure tight tank and a steam supply. When it is considered along with the auxiliary equipment needed to process the tank water and tankage it is not nearly so simple or inexpensive.

Open kettle rendering requires only an agitated, jacketed tank. This is a little more expensive to build than a prime steam unit. The required auxiliaries are a mincer to grind the raw fat and a press to take the excess lard from the cooked cracklings. Together these are much less expensive than the complete prime steam rendering plant. Grinding the raw fat is the major drawback as it is laborious.

Dry rendering requires the most expensive type cooker with its steam jacket, pressure tight cooking chamber and pressure tight agitator fittings. Much of this is offset by the elimination of the mincer to grind the raw fat since whole chunks can be loaded. A press is the only auxiliary required to bring both lard and protein residue into salable form.

Yields of finished lard, as a percent of the theoretical amount in the raw fat, will run from 98% to 99% from either prime steam of dry rendering. Kettle rendering yields are somewhat less.

Considering capital investment, labor, other operating costs, maintenance and product yield, dry rendering is the least expensive of the three ways to produce lard and a salable protein residue product from raw fat.

Newer Rendering Methods.

A number of interesting new methods of rendering have been offered to the meat packing industry in the past few years. All purport to do a better job than the existing methods. The situation is in a state of flux. Still newer methods are being introduced regularly. There is no general agreement on the best basic approach but there are two points toward which all seem to be aiming:

First. Milder processing conditions are being employed. This means lower temperatures in most cases, not just lower average temperatures but freedom from local high temperature spots that cause browning, deepening of the lard color and intensification of the flavor.

Second. Shorter processing times are being employed. From nearly a day for the prime steam method and several hours for the kettle or dry method, rendering time is being cut to a few minutes.

These changes make it possible to make lard which is more nearly like the natural oil in the fatty animal tissue with a minimum of deterioration due to the process itself. The natural oil is bland, odorless and very pale yellow. This ultimate has not quite been achieved as yet.

Size Reduction.

There is one way in which all of the newer processes known to me seek to make these milder and shorter processing times possible. That is preliminary size reduction by mincing or grinding the raw fat to a small particle size. I will mention a number of the processes that I have in mind when I make this statement: The Titan process, the Kinghan process, the Deatherage, the Pavia, the Protease, the Sharples, the De Laval and the Carver-Greenfield. So far this has been accomplished by means of a sausage grinder type of machine. Such a machine has trouble grinding warm fats directly from the dressing floor and will not handle any amount of skin at all.

My personal opinion is that this size reduction step is the real key to mild, fast rendering. The sausage grinder is only a stop-gap answer. A better machine must be developed before there will be any major shift to any of the newer processes. We must depend more on mechanical disintegration of the fat cell walls and less on heat, the enemy of fat.

Quick, Uniform Heating. The next feature that most of the newer processes have in common is quick, uniform heating of the ground fat to melt the oil and finish the liberation of the oil from the protein. Rapid mixing against extensive heating surfaces, with or without added water or direct steam injection is generally employed.

Wet Separation. With only one exception, all of the processes I mentioned earlier proceed to separate the lard from the protein without any attempt to evaporate the water out of the mixture. When the separation is made, lard goes one way and wet protein goes another.

The Titan process uses a screen and small screw press to separate the wet solids from the liquid, and centrifuges to separate the lard from the mixed liquid. There are losses of fat and protein in the waste water. Not all of the fat is recovered from the solids which are in the form of a wet gelatinous mass.

The Kinghan process does not recover any of the protein. It is all lost in the waste water. The waste water may, of course, be evaporated in a conventional stick water evaporating system if one is available. Generally this KP process is limited to use with fats containing very little protein.

The Deatherage and Protease process largely solublize the protein so that it is inseparable from the water present. No specific recovery procedure is suggested by the literature I have seen.

The Pavia process separates the wet solids from the lard by simple straining through a screen or cloth. The solids contain considerable fat with resultant low lard yields. The lard may contain excess moisture unless treated to remove it.

The Sharples and De Laval processes make use of horizontal centrifuges to separate the wet solids from the lard and free water. A second centrifuge is then used to separate the lard from the water and a small amount of fine solids that escapes the first centrifugal separator. There is some loss of protein in the waste water. There is some lard left in the wet solids with consequent reduced yield of lard.

A Big Job Remains. In each of these methods employing a wet separation, the protein is left in a wet form without any specific way of disposing of it. Some, but only an insignificant fraction of it can possibly be used in low cost sausage and loaf products. Generally it must be further processed to give a salable product.

The wet protein can be added to material being charged into prime steam tanks or dry rendering kettles in order to recover the remaining fat and to produce tankage or meat scrap from the protein. These extra steps cost money and prevent the complete elimination of the prime steam and dry rendering plants by users of the newer processes.

Our own experience is that the wet protein can be handled in dry rendering cookers only with great difficulty and at high cost. Users of prime steam plants would probably have difficulty with emulsion formation. In short, these newer processes are not complete processes --- they leave a big job to the imagination and ingenuity of the user. This problem must be solved to permit widespread use of the systems.

I mentioned one exception to the wet separation technique. This is the Carver-Greenfield process which dries the ground fatty tissue at low temperature under high vacuum. The free lard is separated from the dry protein solids by filtration in a special Carver filter press. Much of the lard trapped in the solids is subsequently squeezed out by hydraulic pressure applied to the special type Carver press. Thus the lard and protein are both in usable form at the end of the system. The present drawback to the Carver-Greenfield process is the high cost of the equipment used.

Good Lard. That is the one admirable product of these newer processes. Generally it is of lighter color and free of objectionable quantities of not-fat materials. It is low in free fatty acid and has good keeping qualities compared to older methods. For use as lard it should satisfy almost all lard users and be preferred over lard produced by the older methods at equal or very slightly higher prices. As a raw material for shortening or food chemicals it should be accepted as superior since it will require less drastic preparation for use and consequently will give better yields. For "as is" use as household or baker's shortening, it won't compete with the vegetable oil products in performance.

Conclusions.

Good lard can be produced by either prime steam or dry rendering. A real determination on the part of the producer to do the job well is needed - - not just lip service. A careful study of the proper operation technique, thorough employee training and a management backed quality control program are all that is needed in many cases.

The newer processes all raise production costs as well as lard quality and may add difficulties to the protein processing that would eliminate them as practical methods.

Most of the newer methods so far developed do not permit the complete discard of the older methods because they either are not able to handle all of the types of fatty raw material that originate in a pork packinghouse, or they need one of the older methods to process the wet protein residue produced.

Most of the newer methods give inferior yields of either lard or protein as compared with the older methods.

There is only a limited market for better lard "as is". The premium value of better lard as a raw material for shortening or food chemicals is small and can easily be offset by higher production costs or poorer yields.

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MR. SULZBACHER: Thank you, John.

I think that we have been doing very well in keeping up with Vern's aim to work on time, and George Wilson is happily on hand to direct and keep the questions in order.

MR. GEORGE D. WILSON: Thank you, Bill.

There is one thing which Bill did not mention in connection with our speaker that I think is very worthy of mention. That is his fine example in furthering his education and not saying, "I have had it. I am president of a packing company and that is good enough for me." Many of you may know that Mr. Thompson is working on his Ph.D. in addition to his full-time responsibilities and perhaps a few years in the future when you may have occasion to have him back he will be Dr. Thompson.

I don't have a lot to add to Mr. Thompson's remarks. I think he has covered this subject extremely well.

There is one question I have to ask Mr. Thompson myself and that is with regard to these newer methods. I think perhaps without actually saying so in so many words, he inferred that these newer methods, lower temperature rendering primarily, do increase the stability of the resulting fat or the resulting lard, and there are, as some of you know, countries that object to the use of antioxidants in our export lard. I wonder if perhaps the increased stability that is derived from these newer methods is a factor in this or does he feel that present methods, properly administered, are sufficient for the market? I don't know whether you care to comment on that.

MR. THOMPSON: I will try. You are certainly correct that the stability of the lard produced by most of these newer methods is better. For emphasis I should like permission to rephrase that, and that is that the newer methods deteriorate the stability of the natural fat a little less than the more drastic present methods.

It is also true that some of our international market customers do require lard which has not had an antioxidant added, I don't believe that the difference between well handled lard produced by the newer methods and well handled lard produced by either prime steam or dry rendering is sufficient to overcome the present high cost and lower yields involved.

MR. WILSON: I think that is about the only comment I have.

I wonder if there are questions from the audience to be directed to Mr. Thompson.

MR. A. M. PEARSON (Michigan State University): My question is not to Mr. Thompson; it is to Mr. Brockmann. It is relative to using TBA values for measuring rancidity. I should like to know whether you personally omitted them because of experiences with them or whether they are very useful.

MR. BROCKMANN: No, they are very useful. Ordinarily we have used those although not exclusively with fat but just call it tissue generally. I mean that this method is quite useful in determining in a rough way, say, the quality of trimmings going into frankfurters or something like that. It is not used exclusively for fats. No, I would say it is a very useful method.

MR. WILSON: Isn't it also true that you don't actually measure such things as peroxide by the TBA? I mean its precursor.

MR. BROCKMANN: That is right. Of course, we could have mentioned that we have this old Christ test that measures the hydrate. It is a specific aldehyde. A lot of these procedures are specific, or more or less specific, for the types of carbonyl compounds which develop as a result of a deterioration process.

MR. SULZBACHER: If I could put in a word here, George, the problem has been what to measure, and we don't know at the moment too much about just what it is that we want to measure because we don't know chemically what it is that creates rancidity. The nose and taste buds are still the best measures we have. We have been doing work at Beltsville now for a couple of years, and it is just beginning to appear in publication, that we hope will tell us what it is we want to measure. Those papers have been coming out now in Science and in Analytical Chemistry and one will appear shortly in Food Research that will pretty much show, we think, all the carbonyl compounds that can be recovered from rancid fat.

But if I could get back to John Thompson's presentation, John, would the advantages of a continuous process, such as I imagine would be possible with the Carver-Greenfield process, tend to offset the price of the equipment?

MR. THOMPSON: I think the question needs to be asked, what are the benefits of continuous processing? They usually, of course, are that the size of the plant employed may be smaller and the demand on utilities consequently smaller. My own impression is that a Carver-Greenfield plant operating continuously and sized to replace, say 20 prime steam tanks would cost a great deal more than the combined cost of the prime steam tanks, the stick water evaporators and the tankage driers, or at least as much. There would be or there should be an improvement due to the use of modern sanitary construction, stainless steel and the like.

There is another consideration. Fats do not originate in a continuous fashion from the dressing operations. A typical packing plant operation does not dress and cut hog carcasses all day long. Usually over an 8 or 10 hour period at the most. In many plants like ours one crew does the cutting first and then goes to the dressing floor to take care of the current day's livestock. I don't think that is an unusual procedure. The use of a continuous process which requires 20 hours to complete the rendering of this much fat would require storage tanks and storage facilities for raw fat in which the fat would be very likely to deteriorate and offset the advantages of the milder processing.

MR. AUTTIS MULLINS (Louisiana State University): I should like to direct a question to Mr. Brockmann with regard to the molecular rearrangement of fats on the glycerol molecule; that is, what is involved and to what extent is it being used in the packing industry today.

MR. SULZBACHER: George, could we defer that question because it will be the subject pretty much of one of the later talks?

MR. D. L. MACKINTOSH (Kansas State College): Is there a tendency within the industry, at least where new installations are being made, to replace the prime steam method with the dry method?

MR. THOMPSON: I know of one such change but I cannot say there is a tendency.

MR. WILSON: Are there further questions?

MR. L. J. BRATZLER (Michigan State University): I have just heard rumors about the U.S.D.A. antioxidant question as regards bakery products. What is the status of that at present, I should like to ask?

MR. THOMPSON: I am not well enough informed to comment.

MR. BROCKMANN: John, do you see any possibility of these continuous processes yielding an edible product such as gelatin from the rendering of fatbacks?

MR. THOMPSON: We have been trying to coax gelatin out of our process for the last three years and so far have not been overwhelmingly successful. I think it is one of the real possibilities that by the milder heat treatment the protein would be left in a condition that it could be used to produce gelatin. Maybe by that time, though, we will be producing so much gelatin that we will not know what to do with it. (Laughter)

MR. WILSON: Are there any further questions? If not there may be some others that will come along following the discussion of the next two papers, and I am sure that Mr. Thompson and Mr. Brockmann will be here if you want to bring up some questions then.

MR. SULZBACHER: Now we have the fat produced by the hog. We have learned a little about its chemistry and we have rendered it. We have it in some sort of form in which it might be used, but in recent years, as Mr. Thompson has indicated, the users of this product have changed and the purveyor of the product now has the job of recapturing some of the users that he has lost. There is a good bit of chemistry, as you might imagine, involved in this sort of thing. Some years ago we started to do a little work on rendering at Beltsville which unfortunately we have not kept up with. We began to think then of the fellows who are known in the circles that talk of this thing as fat chemists and we began looking around for a fat chemist. Except for myself most of the members of my group are rather on the lean side. However, there was one of these fat chaps down at New Orleans who worked for a long time with oils, not so much with lard, and he had quite a reputation. He was one of the more potent of the fat chemists in the business.

We induced him to move to Beltsville, which was not hard because he is an old Washingtonian. Since then he has gotten somewhat sidetracked and he is not as fat as he used to be and he has gotten to be somewhat of a protein chemist, but his memory is good and he has kept up with the subject, Mr. Clifton Swift who, as you will see, is pretty much of a fat chemist, will tell us something about the chemistry of food uses of meat fats.

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CHEMISTRY OF FOOD USES OF MEAT FATS

C. E. SWIFT
U. S. DEPARTMENT OF AGRICULTURE

The topic of chemistry of food uses of meat fats is naturally a big topic and I don't want to show my complete ignorance of things that could be discussed; so if I can mention that under this topic are a couple of topics that have been fascinating to me and one of them is stability in that we routinely add antioxidants to the fat to see whether it helps the fat to keep. If you were in the field that specializes a bit and had seen some of the beautiful treatises written on antioxidants that I had the pleasure of studying you would appreciate the complexity of it. Some of the papers I read dealt with the physical chemistry and a lot of mathematics, studies of actual reactions of antioxidants with free radicals and with different oxygenated forms of fats, and this would be an excellent topic probably for a group mainly interested in that.

I was also fascinated by what you can do with hydrogenation which is a subject that I could treat for several hours, I am sure. I have always admired something that I should like to comment on, having been a fat chemist once myself, that is, what industry does with catalysts and hydrogen stunts would be awfully hard for the average chemist to duplicate in the laboratory. I have tried to simulate in a pound bottle the hydrogenation process that is routinely done on nothing less than 50,000 pounds and I learned that the man in the plant has an advantage. I could not always translate my studies in terms of what he would get.

What I should like to get from you at this point is some appreciation of the wonders of what they have done in the making of fats and, of course, what I am speaking about today is some of the same, some of the details of the making of fats and the actual discussion will be about plasticity and the consistency of the leavening action of lard and the natural and arranged glyceride structure of lard and how this affects its behavior in cookery.

You might think about some of the terms if you have not done so. One of the most important probably is plasticity. You ask what is lard. According to Alton Bailey, a plastic solid resists small stresses like a solid but above a certain minimum yields and flows like a liquid. You do get the picture of that. The plastic solid resists all small stresses like a solid and yields at a certain minimum and flows like a liquid. This is what our lard is. Naturally the temperature at which it yields is extremely important to the user.

Now another action of fat and lard is a leavening action. As you know, if you know anything about cookery, you can put in a baking powder and gasses come off and this makes the porosity in the baked product. Well, that is leavening A but leavening B is the action that lard and other fats have that is independent of any added baking powder and this involves entrapment of air. Of course, I think this is not entirely a science but the observation of people who are interested in how fat works in a cake. They have figured that fat traps a little air and then when the dough is cooked where this little pocket of air forms is the point at which moisture vapor acts to expand and cause the cake structure.

The shortening action which is another action that fat has is considered to involve lubrication and with it the ability to weaken structure. For instance, if you have a good pie crust and you hit it with a fork it goes to pieces, and the reason it does this is because fat has been put in between dough particles in sufficient thickness that there is actually a potent point of fracture. This particular action lard has in abundance.

There are, however, a couple of shortcomings of lard and one of these is that it has a grainy structure and a lot of it is translucent and this is not to be confused with some lard that has actually a blue tinge. This translucence suggests looseness and it has a limited plastic range. I don't know whether you got my first definition or not, but the plastic range is the working range for the cook or the baker - whoever is using it. The lard graininess is generally attributed to a tendency to form large crystals and this is part of a story we will develop more later on.

First let's look at slide 1.

(Slide) This will take you back to what Mr. Brockmann said. I could not see his slide but I knew this was just about what he had. We have here the glycerine stripped of its hydroxyl groups and attached to it are UPS which stand for free fatty acid. U is used for unsaturated fatty acid. P is for polymeric. S is for saturated. Then lard is generally stearic; so you would call this GUPS over here, if you were writing a paper on this subject. And at the bottom we have GU-3 which is a glyceride with three unsaturated. GS-3 with 3 saturated and GU-2 is two unsaturated and one saturated. Now knowing that we are talking about glycerides we could leave off the G which frequently is done.

Now we are going to use this terminology a little because the graininess of lard is attributed to the presence in excess of GUPS or a glyceride with one unsaturated, polymeric and stearic, and this is typical of all fats, as Mr. Brockmann said, that they form mixed glycerides. The first students of fats had a simple conception of fats and they naturally preferred them all to be simple glycerides with all three positions occupied by the same fatty acids, and therefore finding that there was a lot of fatty acids in here they figured that there was a lot of glycerides, each one in itself a pure glyceride in the sense that it has three U's, 3 P's or 3 S's. So fats are difficult to separate, but after considerable work they found that this is not the case, that there are actually mixed glycerides such as this. Then with refined studies -- and it took considerable refinement -- they found that in fats there is a certain amount of this U-3 and a certain amount of S-3 but small amounts.

They noticed in trying to secure a good plastic range that they had marked success in mixing different fats, and they found out in doing this, that by putting in a certain amount of low melting and a certain amount of high melting the plastic range was a better working range from a cookery standpoint. You could say that if you had such a fat as lard with an excessive amount of GUPS if you could make these fatty acids move around on the radical and exchange you might come up with a better product. This is in effect what is done. The miracle to me always has been that it is so easily done.

The fatty acids located on the glyceride chains in natural fats have been studied to find out what is the rule that governs the way they are made. You can take any mixture of fatty acids and calculate mathematically if there were a certain amount of fatty acids what the distribution would be if each one were as evenly distributed as it could be. That would give you one theoretical composition. You could take the same figures for fatty acid composition and calculate according to the laws of probability and the laws of chance what this would be.

So in rearranging the fats by the process that we are going to talk about, we promote this randomness or we let the fats follow the law of chance by loosening up the fatty acids on the glycerides and letting them move. In this process of randomizing our percentage of GUPS decreases and with it the graininess in lard that we object to disappears and the large crystals that cause it.

The first time that I heard of this process was some years ago. It was a patented process and I thought that it must have fallen into complete disuse because a couple of decades went by and I didn't hear of anybody making any rearranged lard, but then in the last few years I have seen an increasing amount of rearranged lard being marketed. I have not seen any exact figures but I understand that it has grown to be a considerable item and the reason is that it is relatively simple.

These are the steps in the process. First you have to melt the lard, filter, heat and dry. The reason you have to dry it very thoroughly is that you are going to put in a catalyst that deactivates with water, and if water destroys the catalyst then you won't ever get the reaction. So you have to filter, heat and dry thoroughly. Add the catalyst and then after a few minutes -- a relatively few minutes and each plant has its own time a kept secret -- you add water to kill the catalyst. In other words, this is not a long time reaction. This is a quick reaction. You wash and dry to get out the catalyst by conventional processes. Some of the catalysts use sodium methylate and there seems to be a very popular catalyst -- sodium potassium alloy -- and the product is rearranged lard.

Now there are other catalysts. The first catalyst I saw patented was simply sodium hydroxide. This rearrangement process does not appreciably improve the plastic range we spoke of. It takes out the graininess and the translucence but it does not do much for the plastic range. One process will however. If you would add hydrogenation you would stiffen the product or you could add 5 per cent or so of hydrogenated stock and stiffen the product. However, it has been found that you can eliminate the need for this by using a process called directed randomization. As I said before, it has been noticed by people in the fats field, mixing and blending fats, that mixtures seem to be particularly likely to give a suitable melting range and especially if these GS-3 and GSU-3 glycerides are high. If you can, imagine this process that we have already talked about where, with the catalyst, we have these fatty acids exchanging positions and following the laws of chance, but inject on that a second step of cooling or crystallizing any GS-3 that is formed. This is not a very difficult thing because once you start the reaction which you have to do with a certain amount of heat and you start to chill the most likely crystal that you will get if you cool out anything will be GS-3. Well, naturally having pulled out some S to form S-3 you have left a greater proportion of U there and so now your chances of forming more U-3 are increased.

This does not go on to a tremendous extent. The extent that it does go on greatly improves the properties of fat, and this is directed randomization. The first you would just call randomizing the fat and the second way you use crystallization - directed randomization.

Now in trying to explain this thing a little further we have some slides we can look at.

(Slide) This is an indication of a B for blended fat, and the bottom curve, AH, is for all hydrogenated fat. This penetration is a measure of the softness or the hardness of the fat. You will notice that if you grab right through laterally an area that would be suitable for the cookery process, then AH passes through it relatively fast, while B tends to flatten out, giving you a long range of temperature for this fat to be used. In other words, if you took it out of the refrigerator and it was a little chill and the room was warm or a little hot, it would still have relatively the same softness and that is what you want.

(Slide) I want to apologize for this. I overdid the directed a little with my pencil, but you will see that the per cent solid is again a measure of the softness and hardness. The "as is" passes rapidly up through this range; so if you wanted a good working lard you would have to pick your working temperature very carefully. The randomized lard is only a little better. But the directed, which again I say I over-exaggerated a little, gives us this long range of temperature in which this fat could be worked.

(Slide) This is an indication of what happens when these fatty acids are moving around and you are crystallizing out tri-saturated glycerides that are formed across the bottom. As the S-3 goes up the quantity crystallized out goes up; also the U-3 goes up. As I said, this is because having removed S-3 the chances of U-3 forming are improved. Now up at the top you see SU-2 is dropping off and S-2-U is dropping off. The reason this is going up is to increase the percentage of S-3 and U-3.

(Slide) Now this is a table forwarded to me by Mr. Reimansnyder at the Eastern Laboratory of the Department of Agriculture. It was worked up from laboratory data from a more or less early study of rearrangement and it does not represent any highly polished use of rearrangement. In fact, this is not directed rearrangement but just simply rearrangement. However, you will notice that the percentage of GS-3 went from the original 2.9 up to 4.3 I believe it is, and at the bottom the percentage of GU-3 went up from 18½ to 22.9. You will notice that the GSU-2 dropped down. In my opinion the GSU-3 should have dropped down too, but it just did not in this data.

(Slide) We have been talking about these big crystals and these small crystals. The thing I did not mention is that the secret of the vegetable fat action in cakes in which the lard is particularly inferior has been attributed to the small crystals that are formed in natural vegetable fats. With cottonseed oil and soybean oil the poor action is attributed to the big crystals. Since this rearrangement reduces the size of the crystals, actual cooking tests show that the rearranged lard has this effectiveness in making cakes. This particular measure was done to show what has happened to the size of the crystals of rearranged lard as against natural lard. All these across the top are natural and all these across the bottom are rearranged. If your eyes are anything like mine it is difficult to see that these at the bottom are extremely small as compared with those up at the top but by a fine examination I found that those at the bottom are actually small crystals that tend to aggregate somewhat whereas those at the top are just as large as they look and do not represent aggregates.

With that I close and I will be glad to answer any questions or to correct any misunderstanding I might have created. (Applause)

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MR. SULZBACHER: Thank you, Clifton.

I think if anyone has any questions at this point we might take about five minutes to consider questions for Mr. Swift.

MR. MULLINS: I believe you said you had no figure as to the extent of the use of this rearranged lard.

MR. SWIFT: I used a figure of several years ago and it was that 15 per cent of the lard was rearranged lard. Well, this represents a pretty big thing in a way when you figure that this is still not a process for a small packer. This takes a pretty good sized operation. I heard a talk at the AMIF meeting on this. There was a representative from Procter and Gamble who pioneered this directed randomization. I have to add, too, that I swiped a lot of their ideas for this and I almost got a drawing of their apparatus, but I figured that was going a little too far. Just as John said about this continuous process in rendering, drying the fat is not an especially troublesome thing, but when you put in the catalyst and you promote this reaction, you, of course, have to have a sizeable apparatus and then adding water to kill it involves centrifuges and it is just a big operation when you start to buy yourself some centrifuges. When the product comes out now you don't sell it as lard. It is shortening, and maybe there is a better word than that but I don't know a better word than shortening. But with 15 per cent if you base that on a couple of million pounds or so, it begins to look like there is considerable use of this method.

MR. R. L. HENRICKSON (Oklahoma State University): Some time ago we heard that it is possible to put phosphates into the water tied up in the protein fraction. Has this been dropped or is this still a possibility?

MR. SWIFT: I don't know that anything along that line ever got very far advanced.

MR. SULZBACHER: John, do you have any comment on that?

MR. THOMPSON: No, I don't think I have. I have not been able to do any of it.

MR. SULZBACHER: It sounds theoretically possible.

MR. HENRICKSON: Maybe that is all it was.

MR. SULZBACHER: Well, you may have noticed that we have been talking pretty much about lard up until now. Of course, lard is by no means the only fat that the meat packer is concerned with, and the various methods that John Thompson referred to for recovering lard from pork fat are also used for recovering the fats, both edible and inedible, from other meat animals, particularly beef. In recent years a lot of thought has been given to how to get some of this fat, and especially the fat that we are getting out of our tankage operations and such rendering processes can be put to better use. Somebody got the notion that we might be able to use this for animal feeds as well as for human foods, and quite a little research has gone on in various places, so that now it is quite a common thing for a considerable portion of fat to be included in animal feeds.

One of the groups that was most prominent in the research in this area was the American Meat Institute Foundation, and Mr. Wilder, of the Foundation, who is a biochemist and well-known in nutrition circles, had a great deal to do with this. He has very kindly consented to come and tell us something about the food uses and also the non-human food uses of fats. Mr. Wilder. (Applause)

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NON-FOOD USES OF MEAT FATS

O. H. M. WILDER
AMERICAN MEAT INSTITUTE FOUNDATION

Large quantities of animal fats are produced each year which are not used for food purposes. These tallows and greases result from the rendering of the so-called inedible tissues, trimmings, and waste fats from slaughterhouses, processing plants, retail markets, restaurants, and any other places where meat is handled. The meat packing and rendering industry is now producing this fat at the rate of approximately 2,782,000,000 pounds per year.

In finding uses for tallow and grease, it is necessary to consider the whole fats and oils picture as regards supply and demand since there is considerable interchangeability in the fats and oils and they compete directly or indirectly for markets. For example, we import sizable quantities of coconut oil. If a substitute was developed from domestic sources, then coconut oil would compete in the world markets with our other fats which we export, particularly tallow and grease.

During the past twenty years, the United States has shifted dramatically from having been a major importer of fats to a present position as the world's largest exporter. Exports, however, cannot be counted upon to relieve our surplus in future years. A recent report (Feedstuffs, June 7, 1958, pp. 1 & 4) indicates that exports for the past 6 months have been 25 per cent lower than for the same period a year ago.

New and expanded uses for tallow and grease are essential. New uses stem solely from research and it is evident that we have not had enough research developing new uses for tallow and grease. One of the factors which has deterred expenditures of sizable sums for such research by the producers has been the fluctuating price in comparison to the price of our natural resources such as coal, natural gas and petroleum oil. There have been tremendous sums spent for research on the development of useful articles from these sources and, for every research worker developing uses for tallow and grease, there are literally hundreds working on coal, gas and oil. The universities have not and are not turning out enough scientists trained in fat and oil science and technology and the young scientists are not familiar with the tremendous possibilities for fascinating and productive work with these products.

The use of fat in feeds is an example of a new outlet for fat which has grown rapidly during the past few years. Just a few years ago, the amount of fat used in feeds was extremely small. Now, estimates put the yearly amount at about 500,000,000 pounds and its use is still growing. Of the 500,000,000 pounds used, a very large percentage is animal fat.

When the use of fat in feeds first became popular, it was generally used at relatively low levels where it did a good job of controlling dust and did not upset the nutritional balance between protein and energy. Experimental work with higher levels of fat in feeds showed that improved growth and feed conversion could be obtained when both fat and protein levels were raised and maintained at the proper ratio. Since less feed is consumed per day at the higher fat levels, the vitamins and minerals in the feed must be carefully watched also.

Fat is the most concentrated source of energy currently available for use in feeds, and its use made the terms "high-energy, high-efficiency" become a reality. At the recent meetings of the American Feed Manufacturers Association in Chicago, Mr. Combs of the University of Maryland told about his recent chick tests in which he was able to get broilers weighing 3 pounds in less than 7 weeks with a feed conversion of 1.2 to 1.3 pounds feed per pound of chicken. This feed conversion has not yet been achieved in the feeding of hogs or cattle but there has been a noticeable improvement in recent years.

Time does not permit us now to go into all of the feeding work that has been done with fat. It has been used successfully as a concentrated energy source. It is also of value in the improvement of the physical characteristics of the feed. A rather novel use for fat has been found by Barrick and Wise at the North Carolina Agricultural Experiment Station (A.I. Report 38, A.H. Series 27, March 21, 1958) when fat was used to limit grain intake of steers on pasture. Corn and stabilized fat were mixed and self-fed to steers on pasture, and compared with another lot which was self-fed a corn-salt mixture. The lot fed the corn and fat made greater daily weight gains (2.55 vs. 2.38 lb. per day) and brought a greater monetary return when slaughtered. The steers when self-fed consumed an average of 0.75 lb. fat per head per day which is approximately the level that has given the best results in other feeding tests where the steers were not self-fed. Ruminants, unlike other species do not seem to tolerate high dietary levels of fat, probably because of its effect on the rumen microflora. Poultry and hogs can utilize levels of fat up to 30 per cent or higher as long as the energy level is balanced with protein, minerals and vitamins. Practical levels are dictated by cost, handling equipment, etc., and at the present time are generally in the range of about 2 to 10 per cent.

Pelletted feeds at one time could not contain more than about 5 per cent fat because of problems of maintaining a hard pellet. Several feed manufacturers have now solved the pelleting problem and can add up to 15 per cent or more of fat if desired. High-fat pellets are on the market in several areas of the country.

While the amount of fat used in feeds is a sizable item and goes a long way toward reducing the surplus of tallow and grease in this country, it represents only about 18 per cent of the current production. Exports are currently accounting for approximately 40 per cent of the current production, leaving about 42 per cent to be used for other purposes. This 42 per cent represents about 1,160,000,000 pounds of fat. Part of it will go into the manufacture of soap but a very large portion of it will have to find other industrial uses.

Fat splitting and glycerol production has taken considerable quantities in past years. Glycerol has brought a good price, but the picture there is changing with glycerol being produced from propylene, and by fermentation from molasses. The Optal process currently being developed promises high purity and good yields of glycerol along with methyl esters of fatty acids at low cost.

In many parts of the country, water conservation is receiving increasing attention and is extremely important as our growing population and industry spreads over the dry areas of the country. New products are being developed to seal off the surface of ponds and reservoirs to reduce evaporation. One of these products is a fatty alcohol made from tallow. It is said to spread an invisible film over the water and reduce evaporation between 35 and 60 per cent.

Fatty acids from tallow and grease have many uses. Their use in household soap has declined during recent years but industrial uses have been growing. One of the largest uses for fatty acids is in rubber where they serve as a plasticizer and softener. Specially processed soaps are used in the manufacture of rubber goods where they prevent sticking of rubber to the molds.

The rupture of the oleic acid molecule or other fatty acid leads to the production of dibasic acids, which form the base for many so-called synthetic lubricants for high temperature applications as in jet engines. The dibasic acids also find their way into nylon type polyamids. Heavy metal soaps of the fatty acids of tallow and grease form the base of many lubricating greases. Other oils made from grease are the base, after sulfurization, for many of the extreme pressure lubricants and automatic transmission fluids. Lard oils also serve as a base for lubrication in the working of metal as they lubricate cutting surfaces and tools to a greater degree than any other known material. Lard oils are also used in the lubrication of textile fibers.

There are many other industrial uses for derivatives of tallow and grease but most of them use up only small amounts per year. We need new uses that can consume large tonnages. The tremendous consuming power for chemicals in our economy can supply markets for great quantities of chemicals if they have the right properties. All that is required is the necessary research work to build these properties into the fat or fatty acid molecule. Many possible uses have been visualized and, in some, preliminary work has been carried out.

There is a definite need for methods of permanently waterproofing fabrics, particularly cotton and rayon. Fat ketenes and isocyanates show promises. Waterproofing of a permanent nature is also needed on paper, wood, plaster, concrete, and many other surfaces.

There is a need for soil stabilizing agents to enhance moisture absorption when land is completely dried out, and to prevent erosion. Other types of stabilizers are needed to stabilize or waterproof soils along highways, along the shoulders and in the roadbed. Fat derivatives might be developed which could serve these purposes.

The tremendous highway and construction programs use large quantities of concrete. The properties of concrete can be modified and improved with the use of air-entraining agents to make the concrete more workable during fabrication and to retard deterioration during freezing and thawing. Fatty base additives show some promise in this field. In asphalt for paving purposes too, fatty additives have been found which improve adhesion of asphalt to stone and minimize the brittleness of asphalt in cold weather.

There is another area of possible use for fats that is getting closer to the feed use. For many years, bloat in cattle has been a troublesome affliction when the cattle are on succulent pastures. Recent work has indicated that certain oils may be effective in preventing bloat, either when administered in other feeds or when sprayed on the pastures.

The foregoing is not a complete picture of the non-food uses of animal fat. There are many other uses and prospective uses but in the short time available I can only give you a general outline of the present uses and possibilities for this very important by-product of the animal industry.

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MR. SULZBACHER: I want to thank Charlie Adams for his help in projecting the slides, and especially to thank the speakers for taking the time to come here.

If we have left you people thinking that there is a considerably larger field, both for research and development of applications, than what the meat packer or processor does with his fat that was our aim. Thank you.

CHAIRMAN CAHILL: Thanks to you, Bill and your committee and the participants on this program, for what I consider a very straight forward, clear cut presentation of our fat situation.

This program was designed keeping in mind the questions that you folks turned in at the close of last year's conference. The suggestion most frequently received was that there ought to be ample time for discussion. You will note that throughout the two-day program we have several hours allotted for discussion. If any of you are here for the first time I think we need to tell you that there are no strangers here. We encourage you folks to come forth with your questions and your comments.

I don't think anyone turned in the suggestion that we have a recess, but we knew you were expecting it; so let's take ten minutes now and reassemble promptly.

(Recess)

CHAIRMAN CAHILL: May we have your attention, please? We have one more brief session for this morning's program. There is a committee of long standing and action to report. We have asked Mr. Lowell Walters to chair this session. We turn the floor over to Lowell.

MR. L. E. WALTERS: Thank you, Vern.

Ladies and gentlemen, as you wll know, the function of the Meat Judging Manual and Contest Committee changes somewhat from year to year, and the report that we have this morning is primarily a progress report.

I should like to call on our good friend, Bob Deans, to read the minutes of the coaches' meeting at the International Livestock show last fall, if he will. Bob.

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MINUTES OF MEAT JUDGING COACH'S MEETING

R. J. DEANS

MICHIGAN STATE UNIVERSITY

Meeting was called to order by Lowell Walters. The coaches introduced themselves.

Don Kropf made an announcement regarding the tour of the Quartermaster Food and Container Institute research facilities. Those going on the tour were scheduled to leave the Stockyards Inn by bus at 10:00 A.M. and return approximately 1:30 P.M.

Ken Franklin announced that the Arthur Godfrey television program would originate from the Meat Board exhibit on the morning of December 4. The high individual of the meat judging contest would appear on Godfrey's program and discuss the difference between a Prime and Standard beef carcass. The coach of the high individual would be informed the night before.

Ken Franklin reported on the current status of the meat judging handbook. The pork, beef and lamb sections were reported to be in Franklin's office. The judging section is to be published shortly after January 1. Preparation of the grading section was reported to be well under way. The complete handbook should be off the press prior to the Reciprocal Meat Conference.

The National Live Stock and Meat Board will sponsor live animal and Carcass evaluation clinics in the spring at Baltimore, St. Joseph and Phoenix. Arrangements for the Baltimore clinic were reported to be complete and would be held March 20, 21 and 22. Twelve schools had expressed a desire to participate.

Approximately ten schools were interested in the St. Joseph clinic and March 27, 28 and 29 was suggested as a date and received majority approval by the coaches.

The Phoenix Clinic will be held after April 15th due to the tourist trade. A date will be worked out with the Southwest schools.

Gene King, Texas A&M, made a motion the rules of the meat judging contest be changed to read "in order for a student to be eligible to participate in an intercollegiate meat judging contest he must have completed one semester or one quarter in residence". The rules previously stated in order to be eligible the student must have completed two semesters or three quarters The motion was seconded by Jim Kemp, Kentucky. The motion passed by majority vote, 16 for and 3 against the motion.

Jim Kemp of Kentucky asked the possibility of increasing the number of team members competing in meat judging contests from three to four. Ken

Franklin stated the increase in number of contestants would complicate the mechanics of the contest and possibly some schools would have difficulty in recruiting four contestants.

Ken Franklin stated the Board would like for the Judging Team Committee to bring the list of official judges up to date. The Board requested that the list of official judges include individuals who represent various segments of the industry and who have a thorough knowledge of meat judging. The Board further requested that the list include at least thirty good judges. From this list at least twenty judges will be selected each year to officiate the four contests.

Gene King asked for the present list of official judges. Lowell Walters promised to send a list to each coach prior to the Reciprocal Meat Conference.

Lowell Walters brought up the question of the use of flashlights by contestants in the contest, which was first raised at the American Royal Contest.

Ed Kline stated that after some thought he had changed his mind and was now against the use of flashlights. Ken Franklin also expressed his disapproval. Gene King asked Charlie Murphy for the graders to refrain from using flashlights in the contest too.

Charlie Murphy discussed the employment possibilities with meat grading service for junior and senior students and also students who have graduated. Charlie also stated there had been a committee appointed by the American National Cattlemen's Association to study beef grading standards and that the elimination of conformation from the standards among other things would be discussed at the forthcoming meeting of the Cattlemen's Association.

Ken Franklin stated that the Board will distribute new copies of meat judging contest rules in the near future.

Meeting was adjourned at 10:15 A. M.

Harold B. Hedrick
Secretary

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MR. DEANS: I should like to say that these notes, which are very pleasant to read, were written by Harold Hedrick, who did a very fine job of documenting the meeting.

MR. WALTERS: Thank you, Bob.

You have heard the reading of the minutes with a few side remarks. Are there any corrections or additions to these minutes as read? If not, they will stand approved as read.

I think we will all agree that perhaps one of the most beneficial activities with which we are associated during the year in our meats work as it relates to the teaching phase is that of the live animal evaluation clinics which the National Live Stock and Meat Board has supported so well during recent years, and for a report on the live animal evaluation clinics held during the past year and also a report dealing with the meat judging handbook -- and that remark is old hat to us because we have heard it for quite a number of years -- I am happy to report this morning that there will be a little bit of optimism in this report, I think -- we are glad to have Ken Franklin discuss these two topics with us.

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LIVE ANIMAL EVALUATION CLINICS AND MEAT JUDGING HANDBOOK

K. R. FRANKLIN

NATIONAL LIVE STOCK AND MEAT BOARD

Certainly this conference can be exceedingly proud of having established the live animal evaluation clinics. For those of you who are new, the idea of correlating the live animal with the carcass in concrete form originated in this conference some six years ago. We feel at the Board, and I think the feeling is general across the country, that this certainly is a project to be proud of having a part in.

The clinics have grown in stature and in attendance through the past four years. We have learned as we have gone along how to do things a little better, and the clinics in our estimation have reached the point of being one of the high spots in our cooperative program with the agricultural colleges.

This year, as last year, the Board sponsored three clinics, and when I say the Board sponsored them I should like to emphasize that certainly they were cooperative projects in every sense of the word. There are many segments of the industry to whom we are grateful for their cooperation, but certainly to a good many of you in this room today we have every reason to be grateful not only for attending the clinics but for making them working clinics, some of you whom we have called upon as members of official committees for taking time out of your schedules to do a lot of work in presenting them.

Most of you know the basic structure of the clinics. We present classes of slaughter cattle and hogs to the students, and we ask them to evaluate them on the basis of weight, yield and grade. They have an opportunity two and one-half days later to see the actual carcasses. In addition to that, the students have an opportunity to get acquainted with the key people in the areas the clinics are put on and to find out for themselves whether they are interested in going into the livestock industry and what the future has for them. This we feel is one of the major benefits of the clinics to the students, perhaps not to the professors attending but from the comments we have heard from individual students it is a part of the clinic that has proved very worth while.

Very briefly, to give you an idea of our program this year, which, incidentally, was the largest in the four-year history of the clinic events, we started out in about as foul weather as you can imagine at Baltimore, Maryland. Bob Deans could probably testify best as to that, and if you have not heard Bob Deans' story of how he almost didn't make it to the clinic, it is well worth hearing. We had a tremendous snowfall but in spite of that we had a clinic. Nine schools, counting Bob who finally made it, attended the clinic. There were some 80 students and faculty members who went through the two and one-half day program. We had an excellent selection of livestock and fine cooperation from the Baltimore yards.

The second clinic put on by the Board this year was in St. Joseph, Missouri. We had 125 students and faculty members present at this clinic. There we did one thing out of the ordinary in addition to cattle and hogs. We penned, I believe, 11 lambs, and we let all the students actually go over the lambs and evaluate them. Some of us were quite skeptical as to whether this could be accomplished with a minimum of bruising, but on the whole the affair turned out very well and we will give serious consideration to doing it from now on.

Our third clinic was really a surprise. It was held in Phoenix, Arizona, for the western schools and, as you all know, there is a considerable distance between schools in that area. Nevertheless we had eight schools represented there and a total of 129 students and faculty members, the largest clinic we have ever put on. We are certainly gratified that the western folks attended so well, and we feel that this good attendance has established the West Coast clinic or the western area clinic for years to come. We hope that those schools will be back again.

The program we felt was a very good one. All in all we had a total of 330 students and professors working in the three evaluation clinics. The Board is hopeful that a good portion of those folks who were in attendance will take the work further. We realize that there is a great need for this kind of work and we can only start it. So I am asking you today, those of you who have been in attendance or who will be in the future, to consider extending in your own areas this evaluation idea that started with this conference.

Now for our report on the meat judging handbook. I am sorry I cannot show you a copy of the judging section of the meat handbook as was indicated in the minutes of the November meeting. It is not complete for the reason that it will be more economical to print the entire five sections -- beef judging, lamb judging, pork judging, beef grading and lamb grading -- in one continuous operation, and that is being planned.

Here is the present status and this I believe will be encouraging to you: The judging sections are being set in type. The halftones are being made. We have the grading material, which your judging committee will go over and approve or revise. I believe they will be meeting tonight to do that. If that material meets their approval we can get rolling on it immediately and we will very definitely have the meat judging handbook for you available by the start of your fall school year.

I should like to outline the form in which we intend to publish the book and to secure suggestions or criticisms before we go any farther with it in the discussion period this morning. We plan on an 8½ by 11 loose leaf book divided into the five sections, printed on good stock, and our present thinking is to use as a cover a heavy binding, loose leaf notebook type of cover with a seven-ring binder. That is a little unusual. Most of you probably are familiar with the ordinary three-ring binder, but our consultation with binders and printers has indicated that if we want this book to stand up it should be at least a six or seven-ring binder. That may present problems for your addition of extra material at your own colleges. If that is the case we will agree to go to the three-ring binder, but we feel very definitely that if it is possible it should not be done that way.

The cost of the book has not been firmly established, as you can realize, since we do not have the grading material in a form that the printer can judge it. If you will allow me to make a reasonable guess, if we print the book and use a loose leaf ring binder, which is not cheap, it looks now as though the text will sell for somewhere between $3.50 and $4. We should like to get an expression from you as to how that sounds, whether it is a reasonable price, bearing in mind that the cost of the binder itself will probably be around $1.50 of that price. If we published it as a straight hard-bound book we could probably save almost all of that $1.50. On that decision we would like to have some comment from you so that we can go ahead finally.

Nobody more than I wants to see that book in print, and at least three sections of it will definitely be available to you. We certainly hope that the grading material is in shape so that we can move it right along, too, and have a complete book.

That concludes the report, Mr. Chairman.

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MR. WALTERS: Thank you, Ken, for that report.

In connection with the remarks that Ken has just made with reference to the suggestion which he would like to glean from the group, I am going to ask Ernie Briskey if he will please make some comments with relation to the things that have been mentioned and to accept your discussion along this line.

MR. E. J. BRISKEY: Thank you, Lowell.

I understand that we are running along with our time and being fully aware of Bill Cole's comment last year that I am a little windy in discussion, I think we will move right along.

I think that Bob Deans' comments on the coaches' meeting were very good, and we are all aware of the virtues of these meetings. In just the few years that I have been associated with them I am familiar with Lowell's comments and the changes in connection with the handling of meats, and last year Gene King's addition, changing the eligibility of the students. I think that these two changes add much to our meat judging contest and future changes will probably continue to do the same thing.

I think that the virtues of live animal evaluation clinics can stand for themselves. Needless to say, they are a wonderful addition, a rounding off of the student's training following meat judging and livestock judging work.

With regard to the judging manual, it was even suggested this morning that as it nears its completion, perhaps the duties of the meat judging manual committee would be terminated. We will leave that to next year's conference.

I think that Ken's comments on the cost of the manual are comments that perhaps you would care to discuss as well as the availability. To start off the discussion I might direct one question to Ken. He suggested that this manual will be available in part, to the extent of this availability in quantities. Can sufficient numbers be secured for all the students?

SECRETARY-TREASURER FRANKLIN: Oh, yes, that is no problem. I think we must realize that this in any event will never be a large volume text. I don't think it will run up into the 50,000 quantities, but we will print sufficient numbers on our initial run to take care certainly of more than all the college students we know will be interested in meats. A possible thought is that we may bind this book also in a standard bookbinding at a cheaper cost for the 4-H and FFA folks who perhaps would not be so interested in purchasing the heavy cover.

MR. BRISKEY: Certainly we appreciate the fact, too, that the type of binding that is being used avails the manual to revision as we go along, and certainly we recognize the need for the continuation of the committee, Ken, just on that basis.

Are there any questions that we might entertain now from the floor of either Bob or Ken?

MR. G. T. KING (Texas A. and M. College): I don't have a question but I have a suggestion that it is that you go to the heavy, more durable binder rather than the maybe more economical binder, Ken, that might not hold up. That is a suggestion that I would make.

SECRETARY-TREASURER FRANKLIN: Gene, I know that there are a number of coaches in the group. May I throw out this question, since no one but Gene has been inclined to comment. Does that price sound reasonable to you folks? In other words, if the text will cost that much will you be interested in seeing that your students get it with a substantial binder? I should like to get some expression from the coaches before the Board puts that much extra money into its publication. I think you can appreciate our situation. May we have a show of hands of the coaches as to whether they think the extra cost would be justified? I certainly think that is an expression, and we will proceed then without further objection on that basis.

MR. E. A. KLINE (Iowa State College): I just wonder with regard to the binder for this book, would the three-ring binder be more expensive than an expandible type yet rather permanent binder that might be put together. I don't know what they call them but they go together with metal clips or something like that. They hold up very well; yet it is easy enough to insert or to add material. I am wondering is this ring binder going to be rather bulky for the sake of convenience?

SECRETARY-TREASURER FRANKLIN: The binder that we are considering and we have dealt with about a dozen bindery firms -- there is another project going on at the Board that is going to use a similar type of binder -- the binder we are considering is a one-inch ring, a hard cover, a very stiff cover which I don't think is going to be too bulky in view of the fact that you will probably want to put extra material into the book yourselves.

I know what you are thinking of, Ed. The inch and one-half or two-inch tapering down kind of binder. That is not what we are considering. We are considering an inch ring with a stiff cover that will be approximately a square book.

MR. D. M. KINSMAN (University of Connecticut): We are all, I am sure, interested in supporting the industry and I wonder if it would be prohibitive or feasible to do this book in leather. Perhaps that is out of the question.

SECRETARY-TREASURER FRANKLIN: We, too, are interested in supporting the industry (laughter) but, gentlemen, there is a limit to where you can go. The cost of such a cover -- and believe me we have already investigated it -- the cost in the small quantities that we will be running the book would be quite prohibitive. You would be paying considerably more for the cover of the book than for the contents.

MR. J. R. DYNES (Montana State College): Ken, what would be the possibility, say, of binding 100 to 200 copies in this ring binder for the use of staff members, since we see that changes may come through the years, and for the students use a cover like you mentioned for the 4-H and FFA, something that they would not have to put so much money into? Some of them may go on into the meats field, but they could get a new one when the time came that they were going to use it for teaching work.

SECRETARY-TREASURER FRANKLIN: Our present thinking is to run an original run in the binder of 1,000 copies. That is a small run as a printed run. If and when the situation warrants it, we will probably assemble the same material in a paper-bound book form in larger quantity for 4-H and FFA people. The big disadvantage, of course, as you can see, is that it is difficult to revise that kind of publication. I think that you are going to find that even for student use changes will come along. Certainly we have seen changes in the past five years and it is to be anticipated that there will be additional changes. You are going to find, I believe, more use for your loose leaf version.

We will be printing both. Perhaps not at the same time, but if it is a question of economy I think the other version will be available. I believe that you will find a great deal more use of the loose leaf version.

MR. KLINE: Ken, might I ask how many pages do you anticipate in this volume?

SECRETARY-TREASURER FRANKLIN: Again that has not as yet been determined. It will depend to some extent on the grading section, of course. I will guess that it will be 100 pages, and that is a guess.

MR. C. H. ADAMS (University of Nebraska): I would be interested, Ken, in knowing, if this is going to be a loose leaf affair, if there will be any possibility of procuring the filler without the binder, since there is a question of the binder.

SECRETARY-TREASURER FRANKLIN: Well, that is a difficult one to answer, Charley, from this standpoint. If we go ahead and buy 1,000 binders at roughly $1.50, we have $1500 in the project and if we don't sell them we are more or less stuck. That is why the question is being brought up today, because we don't want to get stuck for $1500 and yet at the same time we want to give you folks the kind of job that you want. Our original committee thinking and discussion with most of the coaches has all been based on the loose leaf proposition. We would prefer to decide one way or the other and have certainly the majority of you folks going along with us. If you don't want the binders, if you don't want to spend that extra money, then we don't want to buy them and to do the necessary assembling job, etc. The easy way to do it from our standpoint would be to print a paper-bound book, but in my own personal opinion and from what I have gathered the best way to do it would be to do it in a loose leaf solid constructed binder.

MR. R. D. HAVENER (Ohio State University): I don't know whether this is a solution or not, but I know that in some cases there has been discussion of the seven-ring, Ken. Would it be possible to publish these just as a group of papers, for those who really want the inexpensive form and let them worry about the binder, and if a coach prefers a three-ring notebook, then he can buy just the sheets in a packet and put them in his own notebook with his own additions that are already punched for the three-ring notebook.

SECRETARY-TREASURER FRANKLIN: Certainly that would be possible, but again I come back to the answer that if we are going to do it we would like to do it in a way that is general rather than to sit with 1,000 binders or 750 binders which, after all, are no good to us. That is why I would be very interested in getting a clear-cut expression and quite shortly, because we are at the stage now when we can say to the binder, "Go ahead and place that order." We must do that within the next month or so if we are to get it to you by the start of the school year. On the other hand, $1500 or $1200 or whatever it will eventually work out is a lot of money to put into something that isn't going to be used.

MR. DALE ZINN (New Mexico A. and M.): I should like to make a motion, if it is in order, and have it put before the Board, that we accept the printing of these copies in the seven-ring binder as such. I should like to make that as a motion and that will give the Meat Board something to work on.

(The motion was seconded by several.)

MR. LYLE ALLEN (University of Illinois): Will the printing be on both sides of the page?

SECRETARY-TREASURER FRANKLIN: Yes, on both sides.

MR. ALLEN: So there will be no room for notes?

SECRETARY-TREASURER FRANKLIN: No, there will be printing on both sides of the page.

MR. ALLEN: I was thinking that a lot of time the students when they are judging like to make notes on the opposite page, if it is printed just on one side.

MR. BRISKEY: You have heard the motion. Perhaps you will repeat it so that everyone can hear it.

MR. ZINN: I move that we accept the seven-ring binder as the cover.

MR. BRISKEY: The motion has been seconded. All those in favor signify by raising your right hand; opposed the same sign. The motion is carried.

Are there any other questions with regard to the manual? I am sure that you can catch Ken out there in the hall from time to time if there are any questions.

MR. H. B. HEDRICK (University of Missouri): Will the Board notify every school when they are available and how to go about getting them?

SECRETARY-TREASURER FRANKLIN: You bet! As soon as we get them out we will be interested in selling them. I might say, as always with all publications of the Board, the cost will be the cost of production. As cheaply as we can have it printed that will be the price of it. We will let you know. We will probably send you an order form. We will let you know what the delivery situation is.

MR. MULLINS: Ken, these publications will be available for the coaches of the 4-H and FFA meat judging teams, will they not?

SECRETARY-TREASURER FRANKLIN: Yes, we plan no restriction on the distribution of them. We will do this, however. In fairness to you coaches we will send you notice of the availability of the publication before we tell anybody else about it so that you can get your orders in. As I said, we will make a small initial run. We will protect you to that extent, so that you may buy your copies before we make a general announcement to the 4-H and FFA leaders that the publication is available.

MR. BRISKEY: We are running out of time. One more question.

MR. H. D. NAUMANN (University of Missouri): Ken, for your information, many of the book stores start to request the names of our textbooks for the semester, say the next fall semester in the summer. If you have a definite publication date and you will let us know as soon as you possibly can, we can relay that information to the book stores so we can get the name down on our textbook list.

MR. BRISKEY: With these comments we will turn it back to you.

MR. WALTERS: I want to thank those of you who have contributed to this part of our program.

I should like to remind the members of the Meat Judging Manual and Contest Committee that we will have a meeting at eight o'clock tonight in room 624 in this hotel.

Thank you.

CHAIRMAN CAHILL: Thank you, gentlemen, for this most optimistic progress report.

At this time in the session we normally like to get acquainted and that works very well coordinated with Ken Franklin's ambition to have a roll call on behalf of the Board.

SECRETARY-TREASURER FRANKLIN: Before we call the roll I should like to make just a couple of comments. Some one has given us some "Chicago Welcomes - A Complete Guide for Chicago and Its Visitors." I don't know where they came from but if any of you are interested in crowding something more into your already heavy schedule, there are copies out at the desk for you.

If you still have any difficulties concerning your room reservations -- I think most of those have been ironed out -- if you will check with me I will let you know to whom you should go to get squared away. If you have any other problems we will do our best to solve them for you.

I was not in the room when Mr. Neumann started his address of welcome. If he said this perhaps it is an echo but, as you know, the National Live Stock and Meat Board is holding its annual meeting on Thursday and Friday of this week. George Wilson has informed me that you should be back from the short course in time to attend the Meat Board luncheon on Thursday if you so desire. If you have not received a ticket from the desk for that and you do wish to attend -- you are pretty sure you will attend -- please see Miss Busam out at the front desk. If you are not yet sure whether you can attend, let me assure you that tickets will be available on Thursday at the registration desk of the Meat Board meeting.

We would certainly like to have you attend as much of the Board meeting as possible and we would like to make you feel welcome there.

To give us a double check this morning on our roll call I should like to reverse the procedure a little. In the past several years we have just gone around the table and had you stand up and announce your name and school so that the oldtimers could meet the newcomers and the newcomers could see who the oldtimers were that they had been reading about. Rather than doing that I should like, with your permission, to go down the list of participants that we have here, to give me a check as to anyone whom we may have missed. So as I call your name will you please stand up so that the rest of the group can become acquainted with you.

You will have badges, and we hope that you will get together as much as possible throughout the four days of the conference.

Some of you are late-comers and have not been listed in your state; so don't worry if your name isn't called with your respective states. We will get to it.

(Roll call.)

MR. KING: O. D. Butler certainly wanted me to express his regret at being unable to be at this conference this year, because of a little Army tour he is having to do over in Louisiana. He said he would appreciate much more being up here in this air-conditioned room than fighting mosquitoes in Louisiana, but he did want me to say a very hearty hello to all of you.

SECRETARY-TREASURER FRANKLIN: I have mentioned to you some of the folks who are changing positions, who are going to other universities. Obviously, none of us knows the extent of the changes; so if there is someone whom I have passed by who is contemplating a change in the near future, we would like to hear from him now, since the whole conference is interested in who moves where and especially Larry Kunkle with his directory problems. Is there anyone who is making a change in the immediate future who would like to announce it?

MR. A. M. PEARSON (Michigan State University): I am not making one but I want to say that Leon Orme has just completed his Ph.D. work and will be joining Bill Cole of Tennessee.

MR. J. F. PRICE (Quartermaster Food and Container Institute): Al is losing one and gaining another. I will be going back to Michigan State next week.

MR. MAX JUDGE (Ohio State University): I will be going to Purdue July 1.

SECRETARY-TREASURER FRANKLIN: Fine! We will be looking for meats work from Purdue.

Well, gentlemen, that completes our roll call. We hope that you do have a chance to get much better acquainted throughout the two days and we hope that the session will be profitable.

CHAIRMAN CAHILL: I think that is all we have and we will reconvene at 1:00 o'clock.

(The meeting recessed at 12:00 o'clock.)

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MONDAY AFTERNOON SESSION

JUNE 16, 1958

The meeting convened at 1:15 o'clock, Chairman Cahill presiding.

CHAIRMAN CAHILL: We will start the afternoon program with a committee project to which we always look forward, and this year is no exception as I look at some of the topics and personnel that are listed here. Chairman Pierce has worked hard in getting this program arranged. I think it would be in order for him to give us a bit of the background and some of the purposes that he considered in lining up this program.

MR. PIERCE: Thank you, Vern.

Well, certainly it is a privilege I think to be Chairman of the Extension and Consumer Education Committee, because we are dealing with various areas of the country that have a great variety of topics or fields of interest in the meat extension game. This meat extension program is something that has been developing rather rapidly in just recent years, and the dean of all meats extension men here at the conference, of course, is none other than our good friend Roy Snyder from Texas A. and M. College.

At this time I certainly want to thank all the members of the Extension and Consumer Education Committee for their wonderful support and suggestions in planning this program. The program may or may not be a composite of all of their suggestions, but we hope that it will bring out a lot of points and items for discussion. We had several suggestions as to how to work with consumer groups, and we had suggestions as to how to work with producers in our areas; we had other suggestions as to how to work with the home economics division in carrying the meats story to the public, and also we had some very good suggestions from the Meat Board as to how they have devised over a period of years a system which they feel would be very beneficial in stimulating interest in meats meetings in the various states.

As a result of analyzing all the suggestions we called upon our friends with the Meat Board to bring us some of their suggestions and ideas for stimulating interest in these meats extension programs. After we have called upon Augie Ring, who is Director of the Merchandising Department, and one of his assistants, Moreland Martin, we will have ample time for discussion to see how these various phases can be worked into extension programs in the various states where we have such a wide variety of interest and activity.

So without any further comments, Augie, I should like to call upon you to discuss the developmental aspects of cooperative programming as far as meats extension work is concerned. (Applause)

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DEVELOPMENTAL ASPECTS OF COOPERATIVE PROGRAMMING

A. R. RING, JR.

NATIONAL LIVE STOCK AND MEAT BOARD

This afternoon we would like just to lay out for you some of the preliminary work that was done in the development and programming for the meats information schools that the Meat Board has conducted over a period of years with states extension service people throughout the United States in order to give you the program outline, and Moreland will give you a run down of what is done and he will give you some ideas that are passed on in connection with these programs to those who are in attendance at them.

I should like to preview with this little story that we like to tell. There are two things to do to learn and to progress. One of the primary requisites of a person who wants to get ahead is to be a good listener. A lot of times you will be surprised what you can learn by listening to people. We suggest at retail meat markets the retailer can learn many ways that he can better serve his customers if he will just listen to the comments that are made in front of his counter, especially if the customers don't know that he is listening, because you would be surprised the things that are said, the remarks that are made. Well, it is important to be a good listener in any occupation that you are engaged.

You have to be a good giver. You have to give a little to get a little, and you would be surprised at the time in the program that you set up when you are willing to give a little, not always being on the receiving end, not always getting, but thinking in terms of the person on the receiving end and being willing to give a little to him. That, in a sense, is the basis on which the meats information schools were developed.

There was a reason for this. The observation was made that the Meat Board in its program of research, education and information was reaching a great many of the American public, the consumers, and yet because of limited staff personal appearances could not be made as frequently and as widespread as they might if we enlisted the aid of other groups. In other words, if we expanded the number of people who were in direct contact with the consumers through an educational program of some kind we could expand this program for meats, and one of the most logical sources was to go back to the state level where we might work with the leaders in the areas who could carry the message to the consumers.

So the decision was made. The next thing to decide was which group to work with. In reading the program for the extension service we learned that their preamble reads, "To carry the latest information to the consumer relative to any aspect of living," you can almost say, and food purchasing and meat buying in particular is a very important part of that. We recognize the fact that 25 per cent of the food dollar is spent for meat and it probably causes more concern on the part of the homemaker than any other single item we need to get to her. So we decided to work through the extension service at the state level, and that wherever there were meats laboratories and animal husbandry departments we would tie those people in with the programming.

After development to that point a very specific program had to be set up in order to submit it to them and to say, "This is what we would like for you to consider conducting in your state," and so the specific and general objectives for the meats information schools were developed. A specific objective of the meats information school as it was set up was to meet the present-day need for the continued development of basic understanding and appreciation on the part of the American consumer of the importance of meat in the daily diet and how best to utilize the product for the maximum benefit.

Quite a bit is tied up with that specific objective. We want her to know that it is important. We want her not only to know that she needs it but to create a want on her part for it, and then to show her how to get the maximum benefit from it if she is interested in economy.

Then the general objectives were set up based upon the parts of the specific objectives. We developed all of these and then set them down in a booklet form. I will just briefly mention that some of the specific objectives were, of course, to let the state groups know of the material, information and assistance that they can get from the National Live Stock and Meat Board:

To take the latest and most up to date information to the consumer through these programs.

To show the fashioning of several meat meals from one large cut of meat.

To demonstrate technics that can be used in the presentation of programs.

And then to strengthen the relationship between the Meat Board and state organizations.

Also the carving of cooked meats was part of this demonstration of meat utilization.

To spell out the program even further we delegated the different responsibilities that would be set up for the sponsoring groups. We won't go into those. We can see that you get a copy of those if you wish.

I will say that the booklet that we developed to be used in connection with these schools or actually the pamphlet that describes the schools sets out the responsibilities of the state groups, the local groups, and the Meat Board, and we are revising it so that it can be used again this fall in some of the schools that are coming up.

Then contact was made with the state director of extension, with carbon copies of the letters going to interested groups within the state; so that all of the people who would be interested in the program and possibly participants in it would be informed.

The state then decided either that it was possible or impossible for them to do it. If the dates that we submitted to them for approval could be worked into their schedule we worked them in. We did find out that it was quite necessary in the scheduling of these programs to work at least a year ahead of the time. At least to get the schedule submitted to these people before their state conventions or state association meetings so that they could include the program for the following year.

After that was decided the local group did most of the leg work. We did a little giving and they did a lot of work. We gave them the brochure but they followed it up with the setting aside of places where the meetings would be held and made the appointment of the local chairmen.

Now the program that we submitted to them was not to be a rigid program. If they wanted to adapt it to fit in with their particular needs that was part of the agreement. In other words, we didn't feel that we could set up a very concrete, solid program, that could allow for no variations because the situations in the various states call for some flexibility in the programming. In some instances we actually sat down with the people ahead of the program and outlined an over-all program. Bob Rust and the folks over in Michigan set up an over-all program that followed this general outline and yet it was developed to meet specific needs in that area. The same thing was done in some of the other states because we wanted to tie in the local groups with the message that they wanted to get across at the same time.

The local group did all of the programming as far as the setting aside of meeting places were concerned, the appointment of the local chairmen, lining up the meat requirements. The Meat Board furnished the personnel for the programming and underwrote the cost of the meat items that were included in the programming. We followed it up then by making available to the visual education departments of the state extension service the slide films on moist heat and dry heat meat cookery.

Then we have written to the directors asking them for any suggestions or evaluations they can make that will help to develop the program and to improve it for the other states.

So part of the development of the program then was the defining of a cause or a reason for having the program. We set up the specific and general objectives, and then we set up the program outline, with the general responsibilities of the different groups that would be included in it.

The programs were conducted by the Board staff traveling with the people at the state level, and Mr. Martin will give you a complete rundown on the over-all program outline, the material that was presented and an idea of the states in which it was conducted and those who were in attendance. If there are any questions we will both be available in the discussion period and will try to answer them.

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MR. PIERCE: Thank you very much, Augie.

Moreland, before we let you take over we have placed on the end of each table three publications. We should like to have you pass them out and we should like to ask as a favor that no school take more than three copies of each publication. I think that in that way we will have enough copies to go around. These publications list all of the publications that have been put out by the Meat Institute and the Meat Board. There is also a little bulletin there on meat on films which lists all of the various films that have been made and put into circulation dealing with meats. These publications are right on the end of each table, so just start passing them down and take a copy of each one.

Augie has outlined the general level of the program planning, as to how the Meat Board works through the various states in getting the meats story to the public. He talked to you on the contact level, so to speak, between the Board and the various states. After these contacts were made and the planning had been put into operation and the schools set up representatives of the Board came out and worked with the various state representatives or the state chairmen in the conduct of the various schools.

Moreland is going to tell you what has transpired in these various schools, and then later we will get into a discussion as to how the information presented can be carried further and can be used in developing the extension programs in your states to fit the various situations.

Moreland. (Applause)

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BROADENING THE SCOPE OF EFFECTUAL MEAT EDUCATION

MORELAND MARTIN

NATIONAL LIVE STOCK AND MEAT BOARD

As Mr. Ring pointed out to you, the meats information schools are an important part of the Meat Board's educational program. I might stress again that these were set up through the state extension service in order to reach the key professional foods people in the different states. We worked through the extension service to reach these professional people because it is these professional food people who reach our American consumers. If they can give them some information through their different programs that they can in turn help themselves, at the same time they will be helping us.

To give them a little information as to an effective program, what it should include, or we should say some suggestions along this line, most of you know that the extension people are professionals in their field, but to help to set the stage for an effective demonstration type program, we did offer them some suggestions or ideas that could be used or developed in presenting a demonstration type program.

I think it might be well to mention them right now. As one of the first things in conducting a demonstration type program, you know how important it is to have proper lighting. If the lighting is not adequate the demonstration type program will not be effective. So we suggested the idea of using added lights. Maybe these could be some portable lights of some sort that could be used to give just a little bit of added light on the table. Many of you have sat in an audience and watched a demonstration and have not been able to see what was going on. That certainly does not add to the effectiveness of a program.

The working surface or table that the person is working on - something similar to this table. You need a nice working surface. You need it to be clean; you need it to be attractive. Something that would add to it would be to drape it like around the front of this table rather than being able to see under the table and it gives just a little neater appearance. Another thing is a nice cover for the top of the table. This can be some type of white parchment paper which is what we use, but something that gives a clean appearance to the table that you are working on with these food products.

One other thing that is very essential for a demonstration type program is to have the table tilted. Many of you have probably done this in meat programs. All you need do is to use two little pieces of two by four and put them under the backside of the table as legs in order to tilt it forward so that the audience can see what is going on.

We have it draped right. We have the table nice and clean. We have it tilted and we have sufficient light for everyone to see what is going on in the demonstration on top of the table. A nice display board is another important thing. Now many of you have noticed people display cuts of meat. Maybe some of the gals would hold it up like this and maybe some of you fellows would hold it up like this, but it is much more effective to have some type of display board that you can display the cut of meat on. This is an idea that is presented to these professional foods people. It is a piece of masonite that is painted a light green. These are made in a three to four proportion so that they are adaptable for television viewing. They are in the right proportion for transmission on a television camera. So if you are displaying a cut of meat you can use the same tray for that purpose as you do for a live audience. Have some type of tray to hold it up on. It makes it look much more appealing.

One other thing. On the top of the table you should have some type of cutting board. It need not be elaborate; it need not be large. This is a piece of plywood that is 1/2 inch and it is cut approximately 15 by 28. It will give you adequate surface for cutting on. It protects the table top. It gives you just a little added interest on the area that you are working.

One of the extension directors said after one of our demonstrations, "A relatively simple program can be effective if care is taken in presenting it." Just a little bit of finesse, a little bit of polish in presenting it will make it much more effective. I think you will agree that these trays are something that are just a little extra. They didn't take much work but it makes the program much more effective for the audience to be able to see the cut of meat that you are displaying.

We feel that in this era of fast living and competition for the food dollar our meats information schools have been a step in the right direction, giving the professional foods people some ideas that they can use in meetings with the nation's consumers.

In our extension programs, as Mr. Ring pointed out, we reached the different professional groups with this meats information. This year -- we might say in the last six months because the majority of these programs have been in the last six months -- we went to 50 cities in 12 states and reached 3,478 professional foods people with our meats information schools. This program was worked through the National Live Stock and Meat Board, as Augie mentioned to you, working through the extension service. In working through these different groups we have reached first of all the agricultural extension groups and this includes county agents, 4-H agents, home economists and the different groups within the extension service, then the educational groups. The educational groups included teachers, high school and college agricultural professors, etc. in the educational field. Then the home economists in business were another important group. They included food editors, radio and TV food program editors and different groups that are in the professional field. Also home economists who are with the different companies like the power companies, etc. And then the food service people. They included dietitians, nutritionists, meat retailers, etc. in the food service field.

In working with these poeple we wanted to reach the consumer. The consumer was the goal of this entire program. The Meat Board has had a

844

connection with these different groups before in working with individual groups, but with our meats information schools we have tied in the extension people because they were the ones who could make the contacts and set them up to do an effective program. Rather than working with the individual groups this time we have worked through the extension people to reach the American consumer with this information on meats. We have reached 3,478 professional foods people in these schools. These people if they met with an average of 50 consumers in the next year would reach almost a quarter of a million consumers with meats information.

The schools were set up on a five-day format. In other words, five days were allotted to each state. The extension people directed the schools to the area that covered the largest portion of the state, and believe me in traveling over some of the states for five days you cover a lot of country. That is what we tried to do, that is, to blanket the states with these programs.

Now some of the states have rescheduled them for next year in order to cover the areas that were not covered during this program.

The program was four hours in length, and it was divided into two segments, two hours before noon and two hours after noon.

As Mr. Ring mentioned to you, sometimes the extension specialist would share the program with the Meat Board representative. Michigan is a good example. In Michigan one of the nutritionists shared the program and also Mr. Rust and that gave us assistance. In other words, an added feature to these information schools.

For a sample of the publications that were distributed at these schools we had a special packet of material that was made up for distribution at these meats information schools. This packet of material included the majority of the reference materials that the National Live Stock and Meat Board has available. It includes graphs of the time of the year when most of the livestock is being marketed, the areas it comes from, and many of our other publications that the majority of you are acquainted with. To give you a little better knowledge as to some of the things that we do have we have supplied you with the material that was passed out. One of these publications is from the American Meat Institute. It has in it all of the publications that are available through the American Meat Institute and the different promotional ideas, our posters, etc. that you can get through them. In there is information that tells about how to get these. Also in this publication I think is the National Live Stock and Meat Board's publications, but in order to keep you acquainted with them we have given you this little booklet that gives the names of the different promotional materials that we have. I thought that you might like to have these for your reference.

Meat on film was another discussion that was given at the different programs to give the people an idea or these professional foods people an idea where they could get materials for use in this type of program.

In one of the programs it was brought up that in presenting these different types of demonstrations, etc. sometimes they didn't know where to get the reference materials or we might say supporting material for their talks. As you can see, with this large supply of material from the American Meat Institute, the National Live Stock and Meat Board, and the U.S.D.A. you do have a large supply to draw on.

To open our programs the first thing that was brought up after the introduction was the story of the National Live Stock and Meat Board, a good discussion on what the Meat Board is, what its activities are, and what it engages in. This served two purposes. It served to reacquaint or you might say to refamiliarize those people with the Meat Board, as to what it is and what it does. It also gave those people who were not familiar with it an introduction to the National Live Stock and Meat Board.

In conducting our programs one of the important things or we might say one of the highlights was the do-it-yourself portion of the program. In order to conduct this we used this sheet that is called "More Meals from Meat" that is available from the National Live Stock and Meat Board. It gives suggestions, as Mr. Ring mentioned to you, on how to get more meals from a larger cut of meat, suggesting to these people ways that they can use a retail meat cut and suggest to consumers how to use it. So this was the sheet of paper that was passed out.

Including other materials that were covered, we had a meats identification quiz and we selected a sample set of 82 colored retail meat cut slides. As a very effective portion of the program, these people would view the meat cuts and try to identify them as to the animal they came from and the names of the meat cuts. Immediately after they tried to identify them we would go back over the different cuts of meat and tell them what they were and note the identifying characteristics of each of the retail meat cuts, giving them a better knowledge as to some of the meat cuts that are available and what to look for in selecting them.

One of the highlights of the day's program -- well, we consider it a highlight -- we sometimes refer to as the coronation of the meal or the coronation of the program. It is the meat carving. A lot of these professional foods people were well aware that proper cookery and proper carving can enhance the palatability of a meat cut. But in order to give them just a little bit of added interest and also to give them some new ideas on meat carving these are some of the things that we carved: a porterhouse steak about 2½ inches thick for breakfast but suggesting that they carve this cut of meat to serve to more than one person, thereby utilizing an extra thick steak. A potroast was another cut of meat that we carved, because it seems that if a sin is ever committed in carving meat more than likely it is committed when the average person carves a potroast. A leg of lamb was another cut that was selected for carving, and a sirloin pork roast. This was a big highlight and it did leave the people in attendance with an enthusiastic attitude as to some of the things that they could do in reaching their consumers with more information or more facts about meat.

As to the value received from these programs, we feel that our efforts will be multiplied many times by meeting with these professional foods people and giving them the up to date information that they can carry to their respective consumer groups.

As to the effectiveness of these programs we have received many letters about them, what they thought of them etc. Here is an example of some of those letters that have come in as to how the programs are accepted in the field. "You have given me such enthusiasm" -- this is a quote, by the way -- "that I plan to practice the carving you demonstrated, and several of our Pittsburgh home economists want the experience also. We have already set up a definite date to try to duplicate what you have shown us."

That is the thing that we are striving for in our meats information schools, to give these people information that they could carry to the American consumers. So with our program with each one of these people reaching an average of 50 consumers during the year, we will have a total of 173,900 consumers reached with meat facts.

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Thank you. (Applause)

MR. PIERCE: Thank you very much, Moreland, for telling us how the programs were conducted in the areas and the localities where they were held.

Now a few comments on how I think this information can be of help to extension workers in their various fields in carrying the meats story down to the groups, and this is in reference to this little sheet right here that Moreland showed on more meals with meat. There are several ideas on that sheet and many of them were demonstrated at these meetings.

The thing that interested me greatly, because it was our privilege in New York state last winter to have a series of these schools, was the interest that was shown by the home demonstration agents and the county agents in asking questions. They said, "These are good ideas that I can go back to my county with and add as a supplement to a general live stock or consumer meeting." Many of the county agents especially thought, "Now these are ideas that we can incorporate, for example, with the beef cattle committee meeting or a swine meeting or a sheep meeting, to tie in the production phase of the program."

Fortunately many of them have already had meetings of this type, with the general purpose of the meeting a production meeting, but they had a little attraction in the form of a demonstration of making more meals from a 6th and 7th rib roast of beef or boning and rolling a lamb shoulder, and a very effective demonstration for the hog producing people was how to utilize the pork loin to the greatest advantage.

It has been my experience in New York to find that these ideas, largely stimulated as a result of these information schools for the food specialists, the home economists, the agricultural agents etc., are helping me greatly in extending meats information to the consumers in the state. As an example of what I think is the effectiveness or an indication of the effectiveness of this program, in past years we have had general meats meetings in cooperation with the food and nutrition specialists and the home economists in perhaps seven or eight counties a year. The schedule came in just about a week ago and for this next fall we have all-day meats meetings scheduled in 18 counties in the state which is an increase in the interest of about 300 per cent. I attribute a large part of the interest to the fact that those persons in attendance at these schools got a lot of ideas of new methods by which they could bring the meats story to the public.

Now I know that several other states have had these schools and have operated in close cooperation with the Meat Board, and to start the discussion I should like to call on Bob Rust to give his impression of the ideas that he received or secured from this school in Michigan, and how they can be used in carrying the meats story to the public in your areas.

MR. RUST: We had very good results, I would say, with the school. I think probably as an indicator of the interest generated by this type of program, shortly after we concluded these schools -- I believe there were about six of them -- we had a request from our rival institution, the University of Michigan, to put on a meats school for their food service personnel. It isn't very often that they come to us looking for help at football time. But the upshot of that school was a statement made by one of the people involved in organizing it, the head dietitian of the University Hospital, that she hoped to make a program of that type a yearly attraction.

I think that by and large the people in the counties are very much interested in this type of information and they are interested in an opportunity to get brought up to date.

I hope that we can in the future work more with some of the people in the high schools, with the home economics programs in the high schools particularly, and possibly progress even to some high school programs. But I think that by and large it has been a very effective method of bringing some of these people up to date on information which they are largely lacking. If you go out among a lot of the home demonstration agents in the counties, and the county agents more so, you will find that their knowledge of meats, and sometimes even of nutrition, is pretty sketchy. This is an opportunity to work, as we did, a cooperative program among ourselves and the animal husbandrymen, the National Live Stock and Meat Board and the home economics department which I think gave us a very effective program judging from the comments we had.

The only problem involved, of course, was the problem of scheduling, and there are always little difficulties in working with extension. As Augie said, it takes about a year in advance if you want to do a really effective job in setting up meeting dates and not run into a lot of conflicts.

MR. PIERCE: Thanks a lot, Rusty.

Now one of the members of the committee asked what can we do for our livestock producers. Roy, I should like to have you make a few comments on your reaction to the demonstration given here, as to how it might fit in down in the state of Texas with your producer program.

MR. R. W. SNYDER: I want to make a comment first and it probably isn't fair, but how close do you have to be to Chicago to get on the program? (Laughter) It sounded marvelous.

I have one other comment to make. We all agree that the sheep people are not eating their own product and we have wondered how we could get them to eat it. I think I made a little report some few years ago that this thing worked very well but it seems to be gaining a little momentum with us. Even where they are having a wool pull in a county or maybe a cooperative lamb sale or we hear agents say, "Now we are going to have a show of calves and lambs and pigs," which is educational, too frequently we feel down there at home that it is a case of bringing them lambs and placing them 1, 2, 3, 4 and having the next class, and where does the education come in if you don't pay a little.

So we are trying to have meetings with the youngsters and actually having a lamb killed ahead of time, probably staging the show the night before they bring in their stuff when they go to the picture show or raise sand around the barns, etc. We are trying to put on a program for them to keep them busy that night and to keep them out of mischief and such things like that. Those meetings prior to the show have been pretty effective.

I could go on and on but the time is too short. I just want to add I don't know how many of you folks felt that radio was quite the stuff and really very helpful to us and I think it is yet to a certain degree, but frankly I never was sold too much on it until quite recently, but here is what we have going and I would certainly want to encourage anybody to take a try at it. I might say that the college and the extension service on visual aids have spent enough money to buy a TV camera and to pick up sound and they have convinced me that little shorts of three or four minutes, and never to exceed five minutes, are the things that these TV stations want. You can get before thousands and thousands of people that you could never touch in any other way.

Those little shorts -- I made one, Augie, on your idea of the use of ham. Why buy a slice of ham? Buy a whole ham and use it this way because so-and-so --. That thing has gone over in the southern part of the state. Within the reach of Houston it has gone over in a marvelous way. But I want to encourage you, if you are not in the TV spirit at all, to try TV shorts, three or four-minute ones, because the stations are really looking for those little fill-ins, and you can get stations that are not too far apart to ask for those little film shorts and they will repeat them occasionally. Let it go for maybe six weeks or even two months and then come back, and you reach people that you never reach in any other way who see it and do it.

MR. PIERCE: Thanks a lot, Roy.

Now we have other extension men here, too. R. D. Havener is here, Leon Orme and Bob Reddish. I should like to ask those gentlemen if they would like to make some comments. Then we will open it up for general discussion among the group.

MR. R. D. HAVENER (Ohio State University): I should like to reiterate the statement that was made about television. We are fortunate in having, I suppose, three commercial stations and the University station in Columbus. I have done, I suppose 40 or 50 programs for those folks, and they like television work in meats. They are not scared of a commercial. If you want to mention the National Live Stock and Meat Board publications they don't care; if you want to promote ham for Easter they don't care. You can reach an awful lot of people. It is pretty difficult to tie down how many you can reach with a program, but one of the Columbus stations say that at nine o'clock in the morning they have a potential listening audience of 250,000 housewives. Even if you only reach one-tenth of them, how easily can you reach that many people if you just try to get them to look at a label on meat?

Especially for you younger men here who are trying your wings, it is awfully good experience to do television demonstrations because it certainly helps to sharpen up your demonstration if you have to do it in eight minutes or in five minutes. It is very good experience and you can at least give a little bit of information to an awful lot of people very easily. It may mean that you will have to get up at six o'clock in the morning and be down at the station at seven-thirty with a quarter of beef on your shoulder, but you can get over a lot of information in a little bit of time.

As Ellis said, one of the most effective ways we have found in Ohio to reach the consumer is through the beef, cattle and swine organizations. You can go into a county and put on a demonstration of what is a meat type hog and nine times out of ten you will be back putting on a consumer program on the utilization of pork, beef or lamb. Also don't overlook your livestock committees in getting back to the consumers. It is an awfully good way to reach them.

MR. PIERCE: Thanks a lot, Bob.

I might add a little with reference to what Roy said about getting the sheep people to eat lamb and the pork people to eat pork and the beef people to eat beef. Often times in New York State we have had livestock meetings and we have had meals in connection with them and I will be doggoned if we didn't have barbecued chicken. That sort of went against the grain for a few of us up there and we had to come up with some sort of idea to stimulate interest in red beef in connection with the general livestock meetings. Over a period of time we have developed a barbecue method. More recently it has been devoted to steak broils or roasting on spits and things like that, and gradually we are seeing that we are making a few inroads into the chicken barbecue business as it pertains to general livestock production meetings.

I understand that Bob Rust has just gotten out a bulletin on outdoor cookery and it should be a source of great help to many of us in planning some of these outdoor meetings.

I should like to throw the floor open now for questions from the entire group to see what comments, if any, or discussion, if any, we have stimulated among you along extending the education in meats in its many ramifications to the general public.

MR. MARTIN: Ellis, I might mention that we are going down into Florida the first part of November with meats information schools.

MR. RING: Texas isn't too far away.

MR. RUST: I should like to make a comment of the type that Roy made about the lamb people not eating lamb. I will guarantee that our meats extension men have not let them get away with that in Michigan. If it is a winter meeting they usually make arrangements with the place that is serving the meal to have roast lamb legs, and in the summer the boys rig up a spit barbecue and barbecue lamb legs outdoors; so I guess it is probably getting where our lamb men would like something else for a change.

MR. PIERCE: Any other comments or discussion?

MR. HAVENER: We tried to get a school in Ohio last year and because of the conflicting dates we never did get it done. However, there is a problem that I see, Augie. Maybe it is peculiar to Ohio State University but I have heard it from other states today. The home economists in extension work are very much concerned about remaining the experts in the state because they are the ones who have to stay there and work day after day. We cannot go into the counties and say, "I am the expert and he is the county gent," because he, too, has to remain there day in and day out and he has to be looked up to as the agricultural leader.

So I would certainly encourage from the state viewpoint that as often as possible you work in a few of your state leaders into the program. That was one of the problems in Ohio. The home economists didn't want somebody else to come in and say they were the experts. They were willing to go along but it wasn't wholeheartedly because that, after all, is their job, and if you can keep them involved I think you will have a lot more success.

MR. RING: Very definitely a part of the reason for allowing the program to be flexible is to give and take. Each one of us has our own feelings, and very definitely if a person has had training, we will say, Bob, in the field of home economics, we are not going to say that we are the cooking experts. I don't think they will question our ability to cut meat or to carve it, but if we talk too much about meat cookery methods, we are invading their realm or their domain so to speak.

The same thing is true in the field of nutrition. I think Moreland would very definitely say that whenever we get into the field of nutrition or into the field of meat cookery we should very definitely try to get the state nutritionist or the state home economist to be on the program because that gives them that which you are wanting.

If any states that would like to have the program will let us know ahead of time we will do this give and take business as far as the planning is concerned, and geographical distance does not make too much difference, Roy. I know we have had a couple or three letters relative to the program in Texas. We have not been able to work it into the schedule mainly because Moreland has been the one who has been doing it. We have tried to make it one activity for Moreland and, of course, that limited the number of states we could get into with the program.

May I make one suggestion? When you are offering the material, this "More Meals from Meat" is probably one of the most popular pieces of literature available from the Meat Board, and a minimum charge has been placed on it for quantities. We have done that so that we can increase its distribution across the United States. We could very quickly deplete the budget by making them available at no charge. It is moderate. If you want to take the material and print it yourself that is perfectly all right. If you want the glossies we will be sure that they are supplied to you.

I should like to tell you one thing in connection with this "More Meals from Meats". When it is revised instead of taking the 10-inch cut we will go to the more predominant 7-inch cut found in meat markets, the reason being that the 10-inch cut is a special cut and a lot of people are breaking the 7-inch right away. So we should have it in here. This will be revised.

I should like to tell you a story about this three meals from a lamb leg. A retailer wanted to put on a lamb sale and he wanted to advertise lamb legs at the cheapest price he possibly could. The way that we felt he might do it best and get the best return on his dollar plus customer satisfaction was to use this three-way lamb leg break. He did it all on the saw because he was interested in production, he wanted to get through as fast as he could. He made the chops, the stew meat, and the leg for roasting and wrapped them up into one package and called it a three-way lamb leg and he had a very successful lamb sale. That is just a suggestion that you might want to pass on to the retailers. Some adaptations can be made.

MR. PIERCE: Thank you, Augie.

I see that our time is just about on the button; so we will turn the meeting back to you.

CHAIRMAN CAHILL: Our gratitude to you, Ellis and Augie and Moreland for sharing this excellent information with us.

We turn now to the Research Review Committee. For the benefit of those of you who are new in the last year or two, this little bit of history: A number of years ago all of the publications that might carry articles relative to meat were assembled and then the titles were divided among our membership. These members perused those publications and abstracted the pertinent articles, and those abstracts were forwarded to this Research Review Committee now chairmaned by A. Z. Palmer -- Zane Palmer of Florida.

That committee has been responsible for editing the abstracts and for making the arrangements to have the abstract cards printed, and one issue of cards has been made available for purchase. I think at this point I should say that I know a very interesting report is coming and I should like to turn the floor over to Zane Palmer. (Applause)

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PROGRESS REPORT ON ABSTRACTING

A. Z. PALMER

UNIVERSITY OF FLORIDA

Most of you have the first set containing 250 abstracts. At least we have sold 64 sets, Jerry Wanderstock has advised me. This is the printing of the second set numbering 360. These are available immediately -- well, as soon as you get home and write a letter and send us the money.

Now John Emerson is going to distribute some papers to you that will enumerate the expenses of this production. I don't think that you are interested in the details of it, but I think that you do want to know that the over-all cost of printing 100 copies was $1479.81, and that Jerry Wanderstock has given me $819.90 that he collected on the previous set, and that we currently need to borrow about $675 or $700 to get us out of debt so to speak.

Does everybody have these? The one figure that you need to notice is the $1479.81.

Now we took over an inventory of these McBee cards in the amount of $398. Our current inventory is because we had to buy some more cards and we bought more than we actually needed, 36,000 to be exact. So we have built up or increased our inventory of cards just in case we get a lot of abstracts next year and we want to start to use them up really quick. So our real cost of this publication, considering our buildup of inventory is actually $1326.41.

I mentioned, Ken, how much we will probably want to borrow.

Now that is enough on that.

If you will, turn to the next page. I do not propose to read this to you. However, you would be surprised how many times we had to correct these mistakes. I have added one here which you may or may not agree with, but I believe this was consistent, Tom, No. 11 was consistent with the way you were doing it previously. You need to follow these suggestions a little more closely.

The next sheet is the form that you put the abstracts on. I apologize for the written material. It did not come out too good. Follow the system that is shown here. First the name and then the initials as is given in the example here. The title is in caps. Most of you have that down pat now.

I don't think I need to add much more except to say that Lyman Bratzler did a wonderful job of indexing his abstracts, and it was so easy for us to index those cards when the time came. Just that little extra would help us out quite a bit and speed our work up.

The way you key it is on the following page. For example, if they are discussing antioxidants in the paper, you would put No. 1 and just show that the subject matter that is covered is antioxidants, and so forth and so on, and you can key as many subjects as you think are appropriately discussed in the article.

Now on the following sheets first you are interested in what your abstracts contain, who have been assigned to these abstracting activities, and who will be abstracting these various periodicals in the future. This is essentially a score board and you can tell pretty well where all of our abstracts have been coming from and which ones have not been yielding very well Over here under the column "Status" write the last issue providing an abstract. We will take Mr. Hall's "Advances in Enzymology," we have an abstract from the last publication, but he has indicated to us that he has checked through 1955; so we know precisely how far along he is in his abstracting of this periodical. Mr. Kastelic, with his "Advances in Protein Chemistry," has indicated to us that he cannot abstract for a period of time due to his added responsibilities and has asked to be relieved of abstracting from "Advances in Protein Chemistry." We are assigning that one to Mr. Schultz, and he will be able to see that this periodical has not been yielding very well.

Now this pretty well tells everybody what their assignments are for the coming year and precisely how far along they are so far as our receipt of their abstracts is concerned. You will note that practically all of you are a few issues behind, but our Michigan State friends are pretty much up to date Tom Blumer got some in just before the bell, before I came up here, but there is plenty of opportunity for us to do a catching-up job this coming year. I should like to encourage this, of course.

Some of you have said, "My periodical does not have enough to worry about." I should like each of you, before next year, to be prepared to recommend to this committee whether or not we should continue your particular periodicals, for after all if we don't get any meat abstracts from a periodical in ten years, then there is some question as to whether we should devote our time to it or not. So we should like you to do that.

Now what I have attempted to do in this material that I have handed out to you has been to give you enough, so that if you have forgotten or misplaced all of your meat abstracting files you don't have to go home and look them up. If you will just hang on to this you can get into business and send in some abstracts. I don't think you need to have any information to devote some time to this activity other than what you have here.

Some of you have requested that we put you on some abstracting activity. Most of the changes have been made to accommodate you, and we may have overlooked or omitted some, but we still have some room and so if you would like to volunteer let us know and we will see that you get a periodical to abstract.

This has been our abstracting activities for the present year, and I am going to turn this over to our discussion leader who is going to handle the discussion in the absence of Mr. Acker.

RESEARCH REVIEW COMMITTEE

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SOME SUGGESTIONS TO ABSTRACTORS

1. Follow specific format of attached sample abstract.
2. Check abbreviation of periodical abstracted (see attached list).
3. If no volume or number is given, list complete paging, year and month, e.g., Pp. 71-83, 1955 (April).
4. For Fahrenheit, use ^{o}F.: for Centigrade, use ^{o}C.
5. Write out per cent (two words).
6. Check spelling and grammar.
7. Type, if at all possible; otherwise write legibly.
8. Provide enough information in abstract to indicate scope of paper. Avoid extraneous details.
9. Keep up-to-date on your abstracting.
10. Proof-read your abstract before submitting it.
11. Names of bacteria are underlined, also names of muscles.

June 1958 RESEARCH REVIEW COMMITTEE Reciprocal Meats Conference

Reciprocal Meat Conference

ABSTRACT FORM

Research Review
Committee
Reference No.

Title Moisture, Ash, and Fat Content of Connective Tissue From Cattle of Different Ages

(exact & complete title, as given by author - All Capitals

Author(s) R. W. Bray, P. H. Phillips, and G. Bohstedt

last name first, with initials only

Site of Investigation or Institution

University of Wisconsin, Madison

name & location

Source	Volume	Num-ber	Complete Pages	Year
Journal of Animal Science 10(2):394-398, 1951. title, vol. no., complete paging, year	10	2	392-398	1951

Objective

To determine if differences were present between certain chemical characteristics of connective tissue from cattle of different ages.

The reason for undertaking the investigation, really a clarification of the title.

Procedure

Ash, moisture, and fat determined by standard methods, with small alterations due to nature of sample.

give only new methods of procedure, otherwise simply list method used.

Results

Moisture and ash content of connective tissue significantly decreases as the animal becomes older, while fat content increases. Moisture and ash content were significantly higher in collagenic than in elastin connective tissue.

give a concise, brief statement

Other subject matter mentioned

Grades

list other subject matter

Abstractor

John P. Doe

Date

date of abstracting

Key to Subject Matter

1. Antioxidants
2. Armed forces
3. Bacteriological
4. Chemical
5. Composition
6. Cookery
7. Fats and oils
8. Freezing
9. Grades and measurements
10. Industry
11. Inspection
12. Marketing
13. Nutritive value
14. Palatability
15. Processing
16. Production
17. Quality
18. Refrigeration
19. Sanitation
20. Serving
21. Statistics
22. Teaching
23. Tools and equipment
24. Miscellaneous
25. Methods
26. Sterilization
27. Carbohydrates
28. Poultry and fish
29. Enzymes
30. Minerals
31. Pigments
32. Protein
33. Vitamins
34. Beef and veal
35. Lamb and mutton
36. Pork
37. Variety meats
38. Sausage
39. Lard
40. Rancidity
41. Commercial
42. Locker plants
43. Packaging
44. Pre-cooked frozen foods
45. Storage
46. Temperature
47. Thawing
48. Flavor and odor
49. Tenderness
50. United States
51. World
52. Wholesale
53. Retail
54. Pricing
55. Distribution
56. Self-service
57. Skin and bone
58. Connective tissue
59. Fatty tissue
60. Muscle
61. Aging or ripening
62. By-products
63. Canning
64. Cutting
65. Dehydration
66. Slaughtering
67. Curing and smoking
68. Insects, rodents, parasites
69. Breeds and breeding
70. Feeds and nutrition
71. Type
72. Color
73. Disease control
74. Offal disposal
75. Trichinosis
76. Carving
77. History
78. Identification
79. Aids
80. Reviews
81. Consumer preference
82. Antibiotics and hormones
83. Toxicity
84. Anatomy and histology
85. Irradiation and ionization
86.
87.
88.
89.
90.
91.

PUBLICATIONS TO BE ABSTRACTED FOR INFORMATION ON MEAT AND MEAT PRODUCTS

Abstractor	No. abstracts first set (250)	No. abstracts second set (363)	Publication	STATUS Last issue providing abstr.	Reported Progress* (to augment prev. column)	Revised List of Abstractors
J. L. Hall	6	3	ADVANCES IN ENZYMology (New York)	13( ) 1952	Checked through 1955	
E. A. Kline	0	0	ADVANCES IN FOOD RESEARCH (New York)			Same
J. Kastelic	0	0	ADVANCES IN PROTEIN CHEMistry (New York)			Same
C. H. Adams	1	1	AGRicultural ENGineering (St. Joseph, Mich.)	32(12) 1951		H.W.Schultz
W. J. Aunan	0	1	AMerican Journal of ANATomy, The (Philadelphia)	93(1) 1953	Checked through 12/55	Same
H. D. Naumann	0	0	AMerican Journal of CLINical PATHOLogy (Baltimore)			Same
	0	0	AMerican Journal of DIGESTive DISEASES, The (Fort Wayne, Ind.)			Same
O. D. Butler, Jr.	2	0	AMerican Journal of PHYSIOLogy, The (Washington, D. C.)	169(3) 1952		Same
J. G. Moffitt	1	0	AMerican Journal of PUBLIC HEALTH and The Nation's Health (Albany, N. Y.)	41(9) 1951		G.T.King
	0	0	AMerican Journal of VETerinary RESEARCH (Chicago)			E.J.Briskey
R. E. Rust	9	0	AMerican MEAT INSTitute FOUNDATION (Chicago)		Chkd.through 6/1/56	E.J.Briskey
E. A. Pierce	0	0	AMerican SCIENTIST (New Haven)			Same
W. J. Aunan	2	1	ANALYST, The (Cambridge, Eng.)	78(924) 1953	Chkd.through 3/56	Same
D. E. Brady	4	0	ANALytical CHEMistry (Washington, D. C.)	24(3) 1952		Same
E. A. Kline	0	0	ANATomical RECORD, The (Philadelphia)			Same
						Same

G. R. Kean	0	0	ANNals of the New York ACADemy of SCIences (New York)			Same
	0	0	ANTIBIOTICS & CHEMOTHERAPY (Washington, D. C.)			Same
	0	0	APPLied MICROBIOLogy (Baltimore)			Same
A. M. Pearson	0	0	ARCHives of BIOCHEMistry and BIOPHYsics (New York)			H.W.Schultz
J. G. Moffitt	0	0	AUSTRALIAN Journal of EXPerimenTaL BIOLogy and MEDical SCIence, The (Adelaide)			R.J.Deans
G. H. Wellington	0	0	AUSTRALIAN Journal of SCIentific RESEARCH. SERies B. (Melbourne)			Same
T. O. Meyer	0	0	BACTERIOLogical REViews (Baltimore)			Same
G. D. Wilson	9	9	BIOCHEMical Journal, The (London)	65(1) 1957		
G. H. Wellington	1	0	BIOCHIMica ET BIOPHYSica ACTA (Amsterdam)	7(4) 1951		Same
	4	0	BIOLogical REViews of the CAMBRIDGE PHILosophical SOCiety (London)	25(1) 1950		Same
J. D. KEMP	0	0	BIOLogical SYMPOSIA (New York)		Not in Ky. Lib.	R.D.Havener
D. E. Brady	0	0	BIOMETRICS (Raleigh, N. C.)			Same
R. H. Ingram	0	7	BRITish Journal of NUTRITION, The (London)	10(2) 1956		Same
E. C. Stillwell	0	0	CANadian FOOD INDustries (Gardenvale, Quebec)			Same
A. W. Oliver	2	3	CANadian Journal of TECHNOLogy (Ottawa)	34(4) 1956		Same
E. C. Stillwell	0	0	CANadian MEDical ASSOCiation Journal, The (Montreal)			Same
L. J. Bratzler	0	0	CEAREAL CHEMistry (St. Paul, Minn.)			R.H.Alsmeyer
D. E. Brady	0	0	CHEMical REViews (Baltimore)			Same
L. J. Bratzler	7	0	CHEMISTRY & INDUSTRY (London)	1( ) 1953		Same
T. N. Blumer	0	0	COLD SPRING HARBOR SYMPOSIA on QUANTitative BIOLogy (Cold Spring Harbor, N. Y.)	up to 1955	usually no meats ref.	Same
James D. Kemp	0	0	CONFerence ON BIOLogical ANTIOXIDANTS, TRANSactions (Packanack Lake, N.J.)		Not in Ky. Library	S.E.Zabisky
	0	0	CORNELL VETerinarian, The (Ithaca, N.Y.)			S.E.Zabisky
P. A. Anderson	0	0	EMPIRE Journal of EXPerimenTaL AGRiculture, The (London)	1946-55 incl.	Chkd. No articles	

Abstractor	No. abstracts first set (250)	No. abstracts second set (363)	Publication	STATUS		
				Last issue providing abstr.	Reported Progress* (to augment prev. column)	Revised List of Abstractors
R.L. Hendrickson	0	0	ENDEAVOUR (London)			Same
R. W. Bray	0	0	EXPerimenTaL CELL RESEARCH (New York)	Nothing in vols. 6, 7, 8, 9		Same
	0	0	EXPerimenTaL PARASITOLogy (N.Y.)	Nothing in vols. 1, 2, 3, 4, 5		Same
O.D. Butler, Jr.	10	0	FEDERATION PROCeedings (Baltimore)	12(1) 1953		Same
R. W. Bray	5	0	FOOD (London)	21(244) 1952	articles not of technical nature	Same
J.J. Wanderstock	0	3	FOOD AND AGRicultural ORGANIZATION of the United Nations (Washington, D. C.)	No. 30-1955	Chkd. through 3/56	Same
T. N. Blumer	3	10	FOOD ENGineering (New York)	28(1) 1956		Same
G. D. Wilson	2	8	FOOD MANUFacture (London)	32(5) 1957	Few articles	Same
A. M. Pearson	8	107	FOOD RESEARCH (Champaign, Ill.)	22(4) 1957		Same
			FOOD SCIence ABSTRacts (London)			Same
L. J. Bratzler	19	122	FOOD TECHNOLogy (Champaign, Ill.)	10(12) 1956		R.L. Hendrickson
V. K. Johnson	1	0	FOREIGN AGRiculture (Washington, D. C.)	16(7-8) 1952		Same
F. W. Carroll	0	0	GROWTH (Philadelphia)			Same
P. A. Anderson	3	0	ICE AND REFRIGeration (Chicago)	121(5) 1951	Checked to 4/56	C. Schoonorer
O. D. Butler, Jr.	6	1	INDustrial and ENGineering CHEMistry (Washington, D.C.)	45(6) 1953		Same
D. Acker	0	3	Journal of AGRicultural and FOOD CHEMistry (New York)	2(16) 1954		Same
	0	0	Journal of AGRicultural RESEARCH (Washington, D. C.) - discontinued with Vol. 78, No. 12, June 15, 1949			Same
T. N. Blumer	5	3	Journal of AGRicultural SCience, The (London)	47( ) 1956		Same
T. O. Meyer	0	0	Journal of the AMerican ACADemy of APPLied NUTRITION (Los Angeles)			Same

Abstractor	No. abstracts first set (250)	No. abstracts second set (363)	Publication	STATUS		
				Last issue providing abstr.	Reported Progress* (to augment prev. column)	Revised List of Abstractors
T. O. Ingram	4	12	Journal of the AMerican DIETETic ASSOCiation (Baltimore)	33(3) 1957		Same
	0	0	Journal of the AMerican LEATHER CHEMISTS' ASSOCiation, The (Easton, Pa.)			Same
	0	0	Journal of the AMerican MEDical ASSOCiation, The (Chicago)			Same
J. D. Kemp	16	16	Journal of the AMerican OIL CHEMISTS' SOCiety, The (Chgo.)	33(2) 1956		Same
	0	0	Journal of the AMerican VETerinary MEDical ASSOCiation, The (Chicago)			Same
V. K. Johnson	0	0	Journal of ANATomy (London)			R.M.Boyer
W. L. Brown	24	1	Journal of ANIMAL SCIence (Albany, N. Y.)	12(1) 1953		A.M.Mullins
	0	0	Journal of APPLied CHEMistry (London)			A.M.Mullins
	0	0	Journal of APPLied PHYSIOLogy, (Washington, D. C.)			A.M.Mullins
D. Krcpf	0	0	Journal of the ASSOCiation of OFFICial AGRicultural CHEMISTS (Washington, D. C.)			Same
C. H. Adams	0	0	Journal of the AUSTRALIAN INSTitute of AGRiculture SCIence, The (Melbourne)			Same
F. W. Carroll	2	1	Journal of BACTERIOLogy (Baltimore)	65(4) 1953		Same
J. Kastelic	22	0	Journal of BIOLogical CHEMistry, The (Baltimore)	20(1) 1953		R.L.Saffle
J. L. Hall	1	0	Journal of COLLOID SCIence (N.Y.)	7(4) 1952	Through 1956	Same
R. F. Kelly	0	0	Journal of EXPerimenTaL BIOLogy, The (London)			Same

Abstractor	No. abstracts first set (250)	No. abstracts second set (363)	Publication	STATUS Last issue providing abstr.	Reported Progress* (to augment prev. column)	Revised List of Abstractors
G. R. Kean	0	0	Journal of EXPerimenTaL MEDicine, The (Baltimore)			Same
B.C.Breidenstein	0	0	Journal of GENeral MICROBIOLogy (London)			Same
	0	0	Journal of HISTOCHEMistry and CYTOLogical CHEMistry, The, (Baltimore)			Same
	2	0	Journal of HOME ECONomics (Washington, D. C.)	44(6) 1952		Same
R. P. Soule	2	0	Journal of MILK AND FOOD TECHNOLogy (Shelbyville, Ind.)	14(1) 1951		R.B.Sleeth
J. W. Cole	8	12	Journal of NUTRITION, The (Philadelphia)	62(1) 1957		Same
	3	0	Journal of PARASITOLogy, The (Lancaster, Pa.)	38(2) 1952		Same
	0	0	Journal of PHYSical CHEMistry, The (Baltimore)			Same
	0	0	Journal of PHYSIOLogy (London)			Same
W. J. Aunan	0	0	Journal of the ROYal SANITary INSTitute (London)			Same
T. O. Meyer	0	0	Journal of the SCIence of FOOD and AGRiculture (London)			Same
J. Kastelic	0	0	Journal of the SOCiety of CHEMical INDustry (London)			J.W.Carpenter
	0	0	LABoratory INVESTIGATION (N.Y.)			R.B.Sleeth
	0	0	METABOLISM, CLINical AND EXPerimenTaL (New York)			J.W.Carpenter
E. A. Kline	2	0	MODERN PACKAGING (New York)	24(12) 1957		Same
F. W. Boren	0	0	NATIONAL PROVISIONER (Chicago)			Same
J. J. Wanderstock	6	6	NEW ZEALAND Journal of SCIence and TECHNOLogy, The (Dunedin)	35(4) 1953	Chkd. through vol. 37(5)	Same
G. H. Wellington	1	0	NUTRITION: DIETETics: CATERING (London)	5(1) 1951		Same

Abstractor	No. abstracts first set (250)	No. abstracts second set (363)	Publication	STATUS		
				Last issue providing abstr.	Reported Progress* (to augment prev. column)	Revised List of Abstractors
R. L. Henrickson	0	0	PHYSIOLogical REViews (Baltimore)	checked through June, 1953	Not related to meats	Same
	0	0	POULTRY SCIence (Manhattan, Kans.)		Not related to meats	Same
	0	0	PROCeedings of the CONFerence ON RESEARCH, COUNCIL ON RESEARCH, AMerican MEAT INSTItute, UNIVersity of CHICAGO (Chicago)	Requested by G.D.Wilson		G.D.Wilson
V. R. Cahill	0	0	PROCeedings of the ROYal SOCiety (London)	Checked through Vol. 145		Same
R. L. Henrickson	0	0	PROCeedings of the SOCiety for EXPerimenTaL BIOLogy and MEDicine (New York)	Checked through 1954	Not related to meats	Same
A. W. Oliver	1	0	QUICK FROZEN FOODS (New York)	15(4) 1952		Same
C. H. Adams	0	17	REFRIGerating ENGineering (N.Y.)	60(11) 1952		Same
J. J. Wanderstock	0	0	REFRIGeration Journal, The (North Melbourne)			Same
H. D. Naumann	0	0	RESEARCH (London)			Same
F. E. Deatherage	1	0	SCIENCE (Washington, D. C.)	116(3013) 1952		Same
M. C. Heck	0	0	SCIentific AGRiculture (Ottawa)			Same
D. L. Mackintosh	0	0	SCIentific MONTHLY, The (Lancaster, Pa.)			Same
E. A. Pierce	0	0	STAIN TECHNOLogy (Geneva, N. Y.)			Same
H. D. Naumann	0	0	TRANSactions of the AMerican ASSOCiation of CEAREAL CHEMISTS (St. Paul, Minn.)			Same
R. W. Bray	0	0	TRANSactions of the AMerican MICROSCOPical SOCiety (Columbus, Ohio)			Same
D. L. Mackintosh	0	0	TRANSactions of the KANSAS ACADemy of SCIence (Lawrence, Kans.)			R.A.Menkel

Abstractor	No. abstracts first set (250)	No. abstracts second set (363)	Publication	STATUS Last issue providing abstr.	STATUS Reported Progress* (to augment prev. column)	STATUS Revised List of Abstractors
	0	0	VETerinary MEDicine (Chicago)			Same
	0	0	VETerinary RECORD (London)			Same
R. F. Kelly	2	0	VITAMINS & HORMONES (New York)	9( ) 1951		Same
Miss Reba Staggs			National Live Stock & Meat Board (Chicago)			Same
			QMC FOOD & CONTAINER INSTitute (Chicago)			Same
W. L. Sulzbacher			United States DEPT. of AGRiculture (Washington, D. C.)			Same

*Where blank --- no work reported

1st Set	2nd Set	
1	10	Thesis
27	3	Bulletins or Circulars
3	2	Misc.

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MR. R. L. SAFFLE (South Dakota State College): There is one especially important item that we want to discuss, that is, money, and we want to determine how much we are going to charge or how much we are going to have to pay for this new set of abstracts. In the first batch that came out there were 250 cards. We charged $25 or 10 cents a card. In this second batch we have 360 cards and if we charge 10 cents a card it will be $35. We did a little guessing and some fast calculating and we found that if we sold 60 sets of the second batch for $25 we would break even or we would have about as much money as I have in my pocket. In other words, we are even with the board which means that we don't have anything to work on. So we want to throw it open for discussion from the floor on what you think we should charge for the abstracts. As a beginning, I would suggest that it might be between $25 and $36. Does anybody have any discussion?

MR. KLINE: How many sets of the first group did you say you sold?

MR. PALMER: Sixty-four. I think that we will get all of those sales this time, too, Ed., and we might get some more, too, but being conservative figure that we will get 60 of them.

MR. MACKINTOSH: Do you still have some of the first ones available?

MR. PALMER: All that have not been sold.

MR. MACKINTOSH: Because we need another one in our school, we promised to buy it in the first place and we have not gotten around to it yet.

MR. BLUMER: It would seem logical to charge what it takes to break even. If it is $25, charge $25. If it is $30, charge $30.

MR. MULLINS: Don't you think, Tom, it would be better perhaps to charge per card and as new cards become available to send them out at the cost per card rather than selling them by sets? This 10 cents a card seems like a fair figure. I mean, what is set No. 1 and set No. 2? What demarcation is being used?

MR. PALMER: Not any other than for this discussion period.

MR. BLUMER: How much did we charge the first time?

MR. PALMER: Twenty-five dollars.

MR. SAFFLE: Two hundred and fifty cards - 10 cents a card.

MR. KLINE: At that going rate you more than broke even on set No. 1, didn't you?

MR. PALMER: Just.

MR. KLINE: How can you afford then to sell more cards at a reduced figure?

MR. PALMER: We had cheaper labor that did a cheaper job.

MR. KLINE: Oh, cheap labor in Florida. I see.

MR. MULLINS: Was the cost of the index file included with the first set?

MR. PALMER: No, we don't have any of the boxes at all, nor do we sell them.

MR. ADAMS: I think, since we charged 10 cents a card for the first set, it only seems logical that we should carry on the same way with the so-called second set because it is all going to be one set anyway, and it will certainly be easier to keep track of the selling price if you can keep it on a per card basis of 10 cents. I think that is the way it should be done. Do you want that as a motion? I should like to make a motion, then, that these cards sell at 10 cents a piece regardless of which set they may be from.

MR. BRATZLER: Second.

MR. SAFFLE: Everybody in favor hold up their right hands; okay. Everybody not in favor hold up their right hands. Carried.

Is there anything else?

MR. MACKINTOSH: That means for $61 you can buy a complete, up to date set?

MR. SAFFLE: Yes.

MEMBER: How do we order them?

MR. PALMER: These are already wrapped in packets. All you need to do is to get your own institutional red tape cut. You can write directly to me because we have them down there and, if you will, make the check payable to the Reciprocal Meat Conference, the Research Review Committee, with my name. That is the way our bank is handling our account. Just doing that is all there is to it.

MR. BRATZLER: One question. When do the revised lists of abstractors take over? Do they take over on the back ones for those of us who are behind or are we supposed to bring them up to date?

MR. PALMER: Lyman, I have a guilty conscience with respect to you because of the inconsistency in the way I treated you and the way I treated Al Pearson. Both of you have done excellent jobs, and I don't want you to think that we don't appreciate it in taking both of you off at the same time. As a matter of fact, I could not afford to, the committee could not afford to, if we want to publish next year. So Food Technology has been given to Bob Henrickson, I think. Right, Bob?

MR. HENRICKSON: Correct, as of today.

MR. BRATZLER: No, sir.

MR. PALMER: I suggest that you work this out as best you can, but I suggest that you start where he left off according to this list, unless he has some already to go that he wants to give to you. That is my suggestion.

MR. PEARSON: I am wondering about the possibility of being relieved of some of the journals that have been assigned to me. I have been abstracting only one journal and I am still years behind and I have about three others.

MR. PALMER: Al, you have done a most excellent job. I will take you off of Food Research and somebody else may expect to receive the job.

MR. PEARSON: You will take me off of Food Research?

MR. PALMER: Yes, or whichever you want.

MR. PEARLSON: I would just as soon stay on Food Research.

MR. PALMER: Then I will take you off of one of the others.

CHAIRMAN CAHILL: Zane, I think we realize that your 20-minute report represents a tremendous amount of work. I think that we might show our appreciation to this group. (Applause)

Zane says that he will make this set of cards available if you folks would like to browse through them a bit.

Is George Wilson in the room? I notice we have a few new faces since roll call this morning. If you will start in the back corner and rise and introduce yourselves, I believe that John Pierce is about the first one in that row.

(Members who had come into the meeting since the roll call arose and introduced themselves.)

CHAIRMAN CAHILL: While we are making introductions, I have a letter here and this might be an appropriate time to read it, since it is from a former Research Review Committee chairman:

"Dear Vern:

"Just a note to tell you that on Monday morning my wife gave birth to twin daughers, weighing 6 pounds 4 ounces and 6 pounds 5 ounces. We are thrilled with this news and, as I mentioned to you in an earlier letter, this will keep me so busy that I will be unable to attend the conference next week.

"May I wish you and the others another successful session.

"Please remember me to the boys.

"Kind regards,

"Sincerely yours,
J. J. Wanderstock"

(Applause)

At this time I should like to ask the participants on the Research Methods Committee to keep in mind to assemble here at the speakers' table when we return from a 10-minute recess.

(Recess)

CHAIRMAN CAHILL: I think I need to back up just a little and admit that I cannot get ahead of Davie Mackintosh. He was not lobbying for ten minutes off. He just wanted to report that he and others at Kansas have been abstracting the proceedings of the Reciprocal Meat Conference for ten years and that those abstracts which are pertinent to meats work are being handled by the Research Review Committee and will be published in due time on the abstract cards. That will be a great help to us.

I apologize, Professor Mackintosh.

As we proceed with the afternoon's program, we see listed the Research Methods Committee. I don't know of a man more qualified to handle this committee and its activities than the man sitting at my right, Mr. Bernie Schweigert. It would just be using excess words to try to tell you folks who he is; so we will turn the meeting over to him to present this portion of the program.

MR. B. S. SCHWEIGERT: Thank you, Vern.

This committee for the last several years has attempted to look ahead and to acquaint you with some of the newer technics in meat research. You may recall that through the leadership of Mr. Hall, Mr. Deatherage, and others in previous years' presentations, new approaches to meat research were discussed with you. I have noted with considerable interest that a number of these technics are being more widely used throughout the researching, the digging down into some of the basic quality factors of meat and its composition and the relation to quality as it generally concerns consumer use.

I am speaking here of methods such as the spectrophotometric method for determining meat pigments, the water-holding capacity or the water-retention characteristics of muscle, protein, etc. that have been considered.

We have this bulwark of talent on this committee, and you will be interested to know that on surveying them on two different occasions this past year almost to a man a preference for being brought up to date on meat enzymes was expressed. This is certainly appropriate from the research method's point of view, since many of the research projects that you may be engaged in might well be augmented by some meat enzyme research. We have, of course, worked with meat enzymes for many years in rather broad terms, but it seemed appropriate, judging from the committee's remarks, that we go back and take a little look at some of the fundamentals about enzymes and their application to meat.

I think many of you know that we at the Foundation have had a long-range research on meat enzymes, on the glycolytic or so-called carbohydrate respiration enzymes some years ago and more recently looking at the mechanistic aspects of the proteolytic enzymes. We also have other programs that touch on hyaluronidase and other specialized enzymes.

We have a formal presentation of a summary of meat enzymes to be given and then two expert consultants to comment following the presentation by this first speaker. So it is my pleasure at this time to introduce to you Bob Sliwinski, one of the newer members of the Foundation's staff. He has been with us about three years and for the last year and a half has been working on the proteolytic enzymes in meat. He is an associate biochemist in our division of physical and analytical chemistry, and he will present to you at this time some of the methodology aspects and concepts with respect to meat enzymes.

Bob.

# # # # # # # # # #

MEAT ENZYMES

R. A. SLIWINSKI
AMERICAN MEAT INSTITUTE FOUNDATION

Well, to go ahead and explain some of the fundamentals of enzymes, I would say I have about 15 volumes on my desk right now, and I don't think I can do it in this short period, but I should like to review and to discuss the nature of enzymes and some of the physical properties of them; secondly, I should like to discuss the significance of enzymes with relation to the meat industry, and if time permits I should like to review some of the work we have been doing at the American Meat Institute Foundation with respect to proteolytic enzymes in muscle.

To attempt to understand the existence of living things it becomes imperative to delve within these living things and study the chemical changes which take place. Some living organisms, for example, green plants and certain bacteria, are able to utilize energy from sunlight and to synthesize complex organic substances of high energy content from very simple starting materials, such as water, carbon dioxide, nitrates and phosphates. Other living organisms, on the other hand, are able to decompose and utilize the energy which is released from these complex substances for their bodily functions -- growth, locomotion, reproduction, etc.

It is known that many of the chemical reactions occurring in living matter or under its influence would, in vitro, occur far too slowly or require temperatures intolerably high for most organisms on this planet. A most striking characteristic of living organisms is the rapidity and precision with which the chemical changes necessary for their existence are carried on. How then can a living system obtain energy and utilize it to synthesize various chemical compounds? What controls the rate of complex biochemical reactions through the so well defined pathways? The answer is that living organisms possess numerous natural entities which speed up chemical reactions to the rates achieved in biological systems. Whether we consider digestion, metabolism, locomotion, fermentation, or putrefaction, literally hundreds of chemical changes are going on, and these chemical changes are catalyzed through the mediation of natural catalysts called enzymes. Enzymes, therefore, make it possible for numerous essential biological reactions to occur at the temperature and under the other mild conditions of the organism itself.

Enzymes are found in living systems; they are produced by the living cell; no living thing can exist without them; yet enzymes themselves are not living. It seems likely from evidence at hand that a majority of all the chemical reactions which occur in organisms are enzyme-controlled.

Long before written history, enzymatic reactions were used by man. Fermentation processes to produce wines, the making of cheese, the leavening of bread, and the manufacture of vinegar are enzymatic processes which stem from ancient times. They are all enzymatic processes which man has used for hundreds of years. These practical applications of enzyme chemistry have occupied a throne in the history of enzymology.

Now that we know that enzymes are around us, that they are within us, exactly what are enzymes? In brief, enzymes are defined as proteins whose biological function is the catalysis of chemical reactions in living systems. In short, they are catalytic proteins. A catalyst may be defined as a substance which accelerates a chemical reaction in which it is not involved in the reaction. In other words, it is not consumed in the reaction. From inorganic chemistry we have learned that platinum has been used as a catalyst for the synthesis of water from two simple chemicals, hydrogen and oxygen. The important characteristic of such reactions is that the amount of catalyst bears no stoichiometric relationship to the quantity of substance altered. The catalytic efficiency of enzymes is extremely high; this can be seen from the fact that pure enzymes may catalyze the transformation of as much as 10,000 to 1,000,000 moles of substrate per minute per mole of enzyme.

It should be remembered that catalysts in general cannot cause reactions to take place; they can only increase the rate of the reaction. In the case of enzyme catalysis, the rate of the uncatalyzed reaction is frequently so slow as to be negligible, and from all appearances it seems that enzymes themselves initiate the reaction. This is not essentially true because the reaction must occur itself, but usually the reaction occurs so slowly -- in other words, the reaction is so slow we cannot tell by any of the products that are formed.

In two respects enzymes excell in comparison with most, of not all, non-biological catalysts: They are unusually effective catalysts, and they are much more specific.

Enzymes, as compared with non-protein catalysts, have a highly specific action. They are extremely selective in their action on a group of closely related substances. The substances on which enzymes act specifically are usually referred to as the substrates of the enzymes.

One last fact I should like to point out is that enzymes as catalysts do not act by their mere presence. They take part in reactions, they change during the reaction, but they describe a cycle and reappear in their original form and, therefore, are unchanged in the overall reaction.

The classification of an enzyme is difficult. Enzymes are usually named in terms of the reaction which is catalyzed. The customery practice is to add the suffix "ase" to the name of the substrate. For example, the enzyme which attacks urea is called urease. That enzyme which attacks tyrosine is called tyronsinase, and in the same way the enzyme which attacks arginine is referred to as arginase. Nevertheless, much of the older nomenclature has persisted and we find such names as pepsin, trypsin, rennin, etc.

Enzymes may also be classified by groups, and in common usage these are such classes as the proteinases, lipases, oxidases, etc. There are many exceptions and certain disadvantages to the system of enzyme classification, but it would be out of place to discuss them during this session.

There are a number of factors which affect the rate of an enzyme catalyzed reaction, such as enzyme and substrate concentration, the effect of temperature and pH.

(Slide) Michaels and Menten, in 1913, postulated the enzyme-substrate theory whereby they assumed that the enzyme and substrate form and are in equilibrium with a dissociable complex, which may also break down to yield product plus enzyme, as we have in the first equation up there. The enzyme substrate complex in turn, since it is dissociable, will form the product and enzyme. Now this enzyme, as I said, may go in a cycle, but it will always end up in the reaction the original substance. On the basis of these assumptions they showed that the velocity of a catalyzed reaction at a given enzyme concentration is proportional to the concentration of the substrate.

(Slide) This next slide shows a diagram of the effect of the substrate concentration on enzyme activity. As we increase the substrate concentration the activity increases until a plateau is reached or a portion where all the enzyme itself is tied up in this enzyme substrate complex and no matter how much more substrate we add the activity will not increase because, as you can see, the substrate must wait its turn because there is just so much enzyme present.

(Slide) In the presence of an excess of substrate the velocity attained is proportional to the concentration of the enzyme. If we have an excess of substrate present in the reaction and vary the concentration of enzyme, there is a direct relationship between the concentration of enzyme and the activity.

Now what is the influence of temperature? Most enzyme reactions, like most chemical reactions, are influenced by temperature, the reaction velocity increasing with rising temperature and decreasing as the temperature decreases. However, because enzymes are susceptible to heat, there is a maximum point reached where the higher the temperature becomes the less enzyme activity we obtain.

(Slide) Here as the temperature is increased the enzyme activity increases until we reach an optimum temperature, and then as the temperature is further increased the activity decreases. This is most likely due to an inactivation of the enzyme by the heat. The optimum temperature of an enzyme, therefore, is that temperature at which the greatest amount of substrate changes per unit time. It should be mentioned that the optimum temperature for any enzyme changes not only in relation to time but also may vary with changes in pH concentration and purity of the enzyme solution.

(Slide) Enzymic reactions are markedly affected by pH, and each enzyme is found to function maximally at a certain pH or hydrogen-ion concentration. This bell shaped curve is very similar to the temperature curve, but as we increase the pH of the enzymic catalyzed reaction, the activity increases until we reach an optimum pH. Characteristically, each enzyme has a pH value at which the rate is optimal and on either side of this optimum the rate is lower as shown on this slide.

The pH optimum of an enzyme may, and most likely does, change according to the conditions of the experiment. For example, the substrate, the source of enzyme material, the element of time, and the buffer solution employed affect the optimum pH of an enzyme reaction.

Some physical properties of enzymes are closely related to proteins. This is mainly because an enzyme itself is a protein.

The solubility of enzymes vary greatly. In general, most enzymes are readily soluble in water; others are soluble in dilute neutral salt or buffer solutions, and still others are quite insoluble in water. In any case, the solubility of enzymes is characteristic of proteins. They are precipitated from solution by protein-precipitating agents, such as concentrated alcohol, ammonium sulfate, and trichloroacetic acid and, like most proteins, are least soluble in aqueous solutions at their isoelectric point.

Enzymes in general differ from other catalysts in that they are characterized by a high degree of specificity. The presence of an enzyme is indicated only by its action on a suitable substrate. If no substrate is known, the presence of the enzyme cannot be proven. In order to get information on the specificity of an enzyme, the enzyme must be introduced into a sufficiently large number of systems or substrates which are thermodynamicall capable of reaction and which differ in one or another of their molecular groups. It then becomes possible to determine the specificity of the enzyme by observing the selectivity in its effect on the rates of the systems under study; therefore, by enzyme specificity, we mean the relationship between enzyme action and chemical structure of the substrates.

There are certain substances which activate enzyme activity and they are known as activators. Activators are referred to as substances of non-specific nature, generally of small molecular weight which appear to be necessary for or enchance the activity of an enzyme. The mode of action of an activator is still not clear.

Within this category fall many of the metal ions. Some enzymes, such as arginase, hexokinase, phosphatase, and certain peptidases, are activated by bivalent metallic ions, such as cobalt, magnesium, manganese, and in many cases nickel. None of these actifactors function universally, but each has a partial specific enhancing effect.

Other enzymes, such as the amylases, require certain anions, especially the chloride ion. It has been suggested that some enzymes may be regarded as metallo-proteins, and that the combination of these enzymes and their substrates occurs partly through metallic ions. In other cases, it has been proposed that the activation by metallic ions is really a reactivation of inactivated proteins. In some cases, though, it has been found that the metallic ions merely protect the enzyme under study from inactivating agents.

The coenzymes, in contrast to activators, are molecules of very specific action and organic constitution. They are usually larger molecules with molecular weights varying from 100 to several hundred. The prosthetic group of the conjugated enzyme is called the coenzyme. Coenzymes can be spli off from the protein portion of the enzyme and upon recombination with the protein portion the activity of the whole enzyme is restored.

I will not discuss the inhibition of enzyme activity to any great extent, mainly because, like the kinetics of an enzyme reaction, the topic would become rather lengthy. But a great deal of information regarding the nature of enzymes and their mode of action can be linked to studies dealing with enzyme inhibition. Almost all enzymes are inhibited by substances which precipitate or denature proteins, such as the heavy metals -- mercury, lead, silver, etc. Many enzymes are inhibited by products of their own activity, for example, glucose, a product in the action of the enzyme invertase on sucrose is also found to inhibit the reaction. Many more enzymes are inhibited by substances structurally related to their substrates. This inhibition occurs due to the blocking of the active centers on the enzyme.

A number of enzymes which contain essential metal ions are inhibited by substances which form complexes with the metal. Hydrogen sulfide and hydrogen cyanide inhibit enzyme activity by complexing with the iron atom of those enzymes containing the iron-porphyrin complex, such as catalase and peroxidase. It should be mentioned that any factor which changes the protein molecule itself, such as heat or irradiation, acts as an inhibitor of enzyme action.

Now we come to the enzymes which are of specific importance to the meat industry. I will essentially mention three groups, the glycolytic, the proteolytic, and the fat hydrolyzing enzymes, although there are many more we could discuss.

The glycolytic process involved in slaughtered muscle tissue is of great importance to the meat industry. After slaughter the carcass is dressed and chilled during which process there is a solidification of fat and simultaneous development of rigor mortis, accompanied with the formation of lactic acid and other acids from tissue glycogen. The conversion of muscle glycogen through a sequence of enzymic reactions to form lactic acid in muscle tissue is called anaerobic glycolysis. The actual sequence of reactions involves numerous glycolytic enzymes, but the overall reaction is shown in the next slide.

(Slide) There are essentially about 30-some reactions involved in the reaction but this is the overall picture where we have glycogeyn plus 3ADP plus 3 phosphate plus $H_2O \longrightarrow 2$ lactic acid plus 3ATP.

One of the chief factors involved in glycolysis in meat is the production of lactic acid with a concomitant decrease in pH. The pH of normal living muscle tissue is approximately 7.2 to 7.4, but after rigor mortis, the pH drops to approximately 5.8. The chief asset of lowered pH in meat is its ability to restrain the growth of certain bacteria. Another factor which is of importance is that at a lowered pH the activity of proteolytic enzymes associated with tenderizing during the process of aging is enhanced. Some workers feel that glycolysis and, therefore, the lowered pH, directly affects the color and texture of meat. Work on dark cutting beef indicates that such tissue is often depleted of muscle sugar and, therefore, the amount of lactic acid produced is decreased with a concomitant higher pH than in normal beef. The sticky condition of dark cutting beef has been considered by some to be associated with the relatively high pH. Whether the dark color and sticky texture is a direct effect of a higher pH is questionable.

The second group of significant meat enzymes is the proteolytic enzymes.

The fact that meat undergoes physical and chemical changes during storage has long been noted. The process of aging meat, which has been practiced for many years has, in general, directly affected the tenderness qualities of meat.

Aging of meat is the process by which the meat is held at temperatures higher than normal for specified periods of time to enhance the qualit of tenderness. It has been suggested that the tenderizing effect of aging is brought about by the action of naturally occurring proteolytic enzymes in muscle tissue. Very little is known about these natural entities which degrade the protein molecule into smaller units. At the present time, studies are in progress which may lead to the identification and characterization of these enzyme systems in muscle tissue. The information obtained through these studies may suggest new approaches to the problem of meat tenderization.

Proteolytic enzymes from other sources, such as glandular tissues, bacteria, fungi, and plants have been added to meat as a means of tenderizing and have gained much popularity. It should be mentioned that artificial tenderizers do not, at the present, indicate completely efficient tenderizing action in practical application, since many problems, including those associated with penetration of the tenderizers, uniform action, and flavor changes still have much to be desired.

The third group of significant meat enzymes is the fat hydrolyzing enzymes.

The fat splitting enzymes in meat are probably more of a detriment than an asset. Lipases hydrolyze fats to form free fatty acids and glycerol. If meat is stored without some control over the lipolytic enzymes, the fats will be considerably altered. The free fatty acids will increase progressively on storage and, depending upon the product, the change may or may not be considered spoilage. For example, we may tolerate a considerable amount of free fatty acid in summer sausage while a similar amount in fresh meat would be considered a sign of spoilage. The lipolytic process can be slowed down considerably by chilling the carcass during storage.

In the production of good quality edible fats, lard, etc., free fatty acids should be as low as possible. Cold storage prior to rendering minimizes the lipase activity and heat during the rendering process inactivates the lipases so that a minimum amount of free fatty acids are produced by enzymatic action.

I should like to describe very briefly one of the many phases which has been undertaken at the American Meat Institute Foundation which is directe toward basic studies of the natural tenderizing entities inherent in muscle tissue per se. These studies were initiated to determine, isolate and define the proteolytic enzymes naturally present in beef muscle.

A simple and sensitive method for determining total proteolysis in meat or meat extracts was developed based on a modification of Anson's method of hemoglobin digestion, whereby the acid soluble tyrosine liberated from the substrate by the enzymes was determined spectrophotometrically. Extraneous interfering materials which were extracted from the meat along with the enzymes and which absorbed in the range of tyrosine were removed by dialysis of the extracts prior to the assay of the enzymes. The data also indicates that proteolytic activity increases after dialysis.

Information has been obtained regarding the optimal conditions of temperature, incubation time, and pH. Using denatured hemoglobin as the substrate whereby the final concentration of the reaction mixture was 1 per cent hemoglobin in .1 molar acetate buffer, the optimal conditions of the assay were found to be at a pH of 4.4 if incubated for four hours at 37 degrees centigrade.

(Slide) We have a series of curves, but since time is getting so short I will just present this one. Under these conditions we found out that the maximum or the optimum time was at four hours at 37 degrees, and on this pH curve we found out the optimum pH conditions with a pH of 4.4. Evidence from the kinetic experiments indicates that a number of enzymes are involved in the over-all proteolysis.

Various extraction and isolation procedures have been investigated and highly active concentrates of the enzymes have been obtained from .6 saturated ammonium sulfate fractions. Cellulose exchangers have been employed in the fractionation and purification of the active ammonium sulfate fractions. By means of an anion exchanger, diethyl aminoethanol-cellulose, several fractions have been obtained containing proteolytic activity.

Studies in progress at the present time are focused toward isolating and defining the various natural proteolytic enzymes in these fractions and to study their mode of action, so that new approaches to the problem of effectively tenderizing meat may be suggested.

I realize I tried to cover a most broad subject in a very short time, but I tried to touch briefly upon a few of the more pertinent aspects of enzymology and to show the importance of some of these enzymes to the meat industry.

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Thank you. (Applause)

MR. SCHWEIGERT: Thank you, Bob.

I hope this gives you some idea of the tools and the technics, as indicated in a few specific applications at the end as well as some of the broad principles, since it may have been a few years since some of you have had enzymes in physical chemistry.

To lead off the discussion we have asked Al Pearson and Joe Kastelic to indicate a few remarks, either to elaborate on some aspect that Bob may have mentioned or to tell of some experiences of their own laboratories relating to enzyme research applicable to the meat research program. So we will ask Joe Kastelic to lead off with his remarks. (Applause)

MR. J. KASTELIC: Thank you, Bernie.

It goes without saying that I am glad to be with you today, even though I find myself now somewhat around the backdoor of meats interests.

I am not certain how we ought to define our subject "meat enzymes" as it may be related to the activities of the "Research Method Committee," the aegis under which we are presumably operating; I shall not therefore make any attempt to do this.

It is sufficient to say that enzymes can be employed as reage for the assay of substrates and for the determination of the nature of the changes wrought in substrate molecules by enzymes. Such techniques are applicable to meats research. This is not a new idea by any means, for Kjeldahl over 70 years ago proposed the use of an enzyme as an analytical tool (invertase for sucrose determination).

Until a few years ago work done on connective tissue was almos entirely confined to the approaches of classical histology and morphology. Thus descriptions of connective tissue fibers, tendon, cartilage, the scales and fins of fish, the fibrils in earthworm cuticle had little or nothing in common. In more recent years the outlook about the nature of connective tissue has been substantially unified by the discovery of a limiting molecular framework for the edifice of connective tissue. This knowledge has come to us from those who have used x-rays and the electron microscope to examine the architecture of connective tissue and from chemists who have analyzed connective tissue. Notwithstanding, we are still abysmally ignorant about connective tissue as a biological entity and its role in meat tenderness.

It is certainly proper to state that the main burden and responsibility of research done on connective tissue must have its setting in the procedures and results of extraction. The necessity of disentangling and of fractionating connective tissue into its component parts is obvious if we are to come to any useful conclusion about its architecture and identifying reactive characteristics. Yet it is in this endeavor that we can come to grief all too quickly. There is little to be gained from investigations done on isolated fractions of connective tissue so altered and modified by unselective and drastic extraction or fractionation procedures that all we really have is tissue garbage to work with. It occurs to me that the use of selective enzymes reactive towards the various components of connective tissue offers a more exciting and exacting approach. Studies of the biosynthesis of connective tissue would provide a marvelous approach to an understanding of the nature of the various forms of these tissues, for it would provide information about how they are elaborated and given their final form. The present view is that such studies lie beyond current research horizons. The alternative approach to an understanding of the properties of connective tissue is to use enzymes which would degrade it in specific ways.

There are many descriptions of elastin--morphological, histological and chemical; all show it to be heterogeneous. What we would like to know is its biological properties and how they are associated with its chemical structure. Many biological entities are enormously complex chemically; yet they may possess but one specific activity, for example, a protease which splits the peptide bonds of protein. Let us consider briefly what has been learned about elastin from enzymatic studies.

The biochemical properties of elastin have been discussed by several workers who have studied the effect of bovine pancreatic enzymes on elastin. Banga and Balo (1957) and Hall and Gardiner (1955) have shown that the enzymes of beef pancreas act on the outer amorphous mucoprotein as well as on the inner fibrous component of elastin in rather specific ways. Their work introduced the possibility that the outer casing of elastin acts as a stabilizer in the sense of a protective sheath against the action of the enzyme which degrades the inner or fibrous portion of elastin. Partridge and Davis (1955) have shown that one of the components of the elastase enzyme complex is a proteolytic enzyme. Banga and Balo (1956) succeeded in the isolation from pancreas of two mucoproteinases which split specifically the mucoproteins bound to connective tissue but which do not digest the polypeptide chain. One of these shows its greatest specific activity on the elastomucin component of elastic fiber; the second enzyme splits one component of collagen fiber. These mucoproteinases usually occur as contaminants in elastase preparations. Banga and Balo prefer that the name of elastase be reserved for the proteolytic enzyme which dissolves elastin fibers and with good reason.

If we can assume that tenderness of meat can be associated at least in part with connective tissue, it seems rather obvious that we need to know something about the factors which determine the composition of connective tissue and its reactivity in relation to nutrition, age, and the biochemical events which describe changes occurring post mortem. It has been shown, for example, that the mucoprotein composition of collagen fibers varies according to age.

While my experiences in this area of research interest does not qualify me to be authoritative, I am convinced about the promise held in the biochemical approach. The use of enzymes as analytical tools has been established as a powerful adjunct to research done on animal tissue. If there is anything to be said in a concluding way, it is that the meats worker has been much too conservative in his approaches to problems he would like to solve.

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MR. SCHWEIGERT: Joe is a real scholar, isn't he?

Al Pearson has been pioneering in many ways. Those of you at the AMIF meetings may have heard about some opening wedges that he and his associates are putting into the flavor research field and they are also getting into some work in which enzymes may broaden the horizons in meat research. I should like to call on Al at this time to share a few of these thoughts with us. (Applause)

MR. A. M. PEARSON: Thank you, Bernie.

Members of the Conference: I am afraid you have greatly overrated our work on enzymes, Bernie. Our interest in enzymes has been strictly in relation to another problem and, therefore, we are certainly not qualified as experts.

I might state that when I start to think about the subject of enzymes my thoughts go back to the great old enzyme chemist, J. B. Sumner, whom I had the good fortune and the misfortune, perhaps, to take a class under while in graduate school. The story used to go around that three boys went over and took the course together and that if you added their scores together they never had 100. (Laughter)

But I remember very clearly J. B. Sumner's story of urease which he told in this class. Urease, as you may or may not know, was the first enzyme that was catalyzed -- I think that this is one of the outstanding properties of our enzymes, one thing that we can think well of, and I presume that another is that they can be crystallized and give us the possibility of studying them and their properties in pure solution or relatively pure solutions.

There was a lot of bitterness in J. B. Sumner. He crystallized urease in 1926. I went to Cornell in 1946 and he had just been awarded the Nobel prize for the work that he had done 20 years earlier and he had kind of mellowed and you never had to add more than one person's score to mine to make it 100. He felt rather good now, but he did tell this story in class. I remember distinctly that he stood up and he always looked at the ceiling as he lectured, and he said that he had crystallized this enzyme and when it came time for the Nobel prize to be awarded one of the members of the committee, a German, said that it could not be crystallized and that as a result of this he was withheld recognition by the Nobel Committee until 20 years had elapsed and this man had died or he would never have received such recognition.

The moral of that story is if you cannot whip your enemies maybe you can outlive them.

But J. B. Sumner told how he had submitted the article to journal after journal and was turned down on the basis of this man's claiming that enzymes could not be crystallized, and in conclusion Sumner said that he submitted the article to the Journal of Education, which he said was a second rate journal, and they graciously accepted it for publication and so he took a lifetime subscription.

So if you ever have trouble publishing something that you think is worthwhile, I think you might reflect back on his experience.

I think probably one of the classical pieces of work on meat enzymes was done in the U. S. Department of Agriculture about 1918, and it was published, I believe, in Miscellaneous Publication by Hoagland, McBride and Boak. For this study they had a very difficult time in obtaining sterile meats so that they could actually follow the enzymatic changes. I think it is quite an interesting study and it would well bear looking into, if you are interested in this problem.

More recently, Pluton, at Harvard, has been very prolific in the field of enzymes which cause the natural catalytic changes and breakdown of the tissue after death. Of course, they are very closely allied to the problem which we are interested in. At the time that I took biochemistry the cathepsins were classified all into one group. Nowadays they are classified into about four or five different fractions and each one of them is specific and acts only upon certain substrates, as Mr. Sliwinski has brought out; so therefore this problem has become more complicated as we have learned more about it. This makes it somewhat more difficult to attack it.

Mr. Sliwinski indicated that certain enzymes may be undesirable, and I think I would like to elaborate a little on that, because we are interested in some of the flavor changes that take place during irradiation. I think that during the early history of the irradiation projects of the Quartermaster Corps they failed to recognize such changes. Most of the meat was irradiated in the raw state. It was held at temperatures for long periods of time and during these periods of time we got a natural breakdown of the tissue due to enzymatic changes, not sterile but still these enzymatic changes went on.

Perhaps this method may be a method of following the changes that occur. We can sterilize it much easier than the early workers could when they did their work. We have found, in our work at least, that amino nitrogen continues to increase very rapidly at room temperature with natural meat enzymes. We have recently initiated a study and we have been adding cathepsin, that is, the crude cathepsin, the whole cathepsin, not trying to isolate its different components, and we find that we still get increases in the amino nitrogen which are even beyond those when you just have the raw meat; so that this indicates that this is quite a problem in research and one that we could well expand to fin out just what is happening here.

More recently at the AMIF meetings a rather interesting problem was posed by some flavor chemist from the Evans Research Corporatio in New York City. He mentioned the fact that each of the plants has certain enzymes present in its tissues. If you take the flavor enzyme, for example, in the cabbage, you can develop the flavor in the cabbage by adding an enzyme from mustard, but if you add the cabbage enzyme back to the cabbage you can greatly increase the amount of flavor you will get. It seems that the natural enzymes help to develop the flavor bette than when you use enzymes from another source. I think that this is of some significance and certainly would concern us so far as flavor work is concerned in meats.

I think that the situation in the use of commercial tenderizers well needs some explanation and some thought. Currently there is a considerable amount of this going on in the industry, but Mr. Schweigert is much better qualified to tell you how much and what it means at this time than I am. All I know is -- well, I understand there is a lot of feveris activity and we do know that there is a lot of interest in enzymes in industry. Some of it, as I understand it, is being fed, and in some cases it is being injected. There are various other approaches. Some of it is by infusion into cuts. I hope that Mr. Schweigert, when I have sense enough to sit down in a minute or two, will elaborate on some of these developments and the knowledge that has been gained.

However, I want to throw out one more thing. Much of our work has been done on the basis of added enzymes. I recently visited a small meat establishment in East Lansing. I had visited them two years ago but I had not been back since, and I was surprised to find them preparing large amounts of steaks and selling them very cheap made from low grade carcasses dipped in enzymes and the steaks were sold in eating houses at a price that people would pay. It seems to me that natural meat enzymes is an approach that we might well think about.

Mr. Sliwinski also mentioned activators and inactivators. We have certain activators and certain inactivators as he so ably showed us and I think that these might possibly bear exploring in the meat industry.

Thank you. (Applause)

MR. SCHWEIGERT: I thought I was just to moderate the discussion, but he threw me a curve there. Before commenting on that I should like to throw out a couple of other comments. I hope you have seen that Mr. Sliwinski has developed the broad base of this whole discussion of new research approaches to enzymes, and Mr. Kastelic and Mr. Pearson have indicated some specific applications and opportunities as we see the broad basis for research in meats become more widely used and thought of on these levels, but I should like to throw out a couple of others.

You know that meat was muscle in a living animal, and much research on experimental animals dealing with enzyme chemistry and physiology can be very useful in concept and, in fact, when you begin to think about the ramifications of all of these enzymatic changes in a meat cut, a piece of meat is not dead from the standpoint of the respiration and catalytic processes that are going on starting with rigor mortis and one can learn a great deal.

Joe Kastelic touched on collagen. I should like to emphasize that there is much activity in collagen diseases in man and a lot of very excellent enzyme work is going on which we can draw on in meats research. Some of you may not have thought to look in those places, if you are interested in mucopolysaccharides or mucoproteins as substrates or connective tissue substrates in some of the work you are doing.

I had better handle this little challenge from Al before throwing the floor open for general discussion on meat tenderizing enzymes.

We have been doing our best to assist in developing some fundamental principles by which such enzymes might be used on a more sound basis than an empirical system. George Wellington got the full treatment on the empirical system this noon. I believe that about 10 of us had enzyme tenderized steaks in this hotel, but I guess Lyman Bratzler was smart enough to order something else. The rest of us thought the steaks were fairly good for $1.50, but there is much to be done in getting this on a better basis. Many smaller companies without the technical know-how may be using them and not in the best way, but it is a real development that you can help with and develop better because it is very important.

There is much experimental work on injecting enzymes and other technics, none as yet in commercial production in interstate commerce. As you know, the U.S.D.A. have approved the use of enzyme dipped procedures prior to freezing and distribution through their meat inspection division.

May I also remind you of the discussion by George Wilson last year on high temperature beef aging in which accelerating these natural enzymes by aging at higher temperatures was also mentioned. This ties into the discussion that Al Pearson referred to of enhancing the inherent activity of these enzymes, and also the discussion by Mr. Wang, of our staff, here in previous years, pointing out the specific modes of action, structural and on the taste panel of certain of these tenderizing agents, these again being experimental.

I hope that we have achieved our objective with the committee's report; that is, to broaden the potentials in your minds of where meat research can go in your own institutions. Also some of the people you may wish to contact if you are considering developing some of this research.

I would caution you to look with a rather critical eye on some of this enzyme work relating to flavor enhancement. Again it may be quite empirical and need very careful attention before news releases become realities and it is something we should watch.

Mr. Chairman, I think we have a few minutes for general discussion by the members of the conference and I will ask these experts to comment.

MR. ADAMS: I should like to know if you would want to venture a guess as to the amount of commercial tenderizing agents that is being used.

MR. SCHWEIGERT: Well, I suppose I might attempt to handle this one. This information is not available to us or to anyone else. We have been asked a great many times. The best public statement I have seen was in the January 6 issue of the Wall Street Journal in which it was stated, I believe, 20,000 gallons of meat tenderizing enzymes are used per month. Is that right? Does anybody remember that specifically?

MR. JACK T. GESLER (Polytechnic College): Either the last issue of Food Engineering or one of the subsequent issues made that statement plus the fact that $10 million per year is spent for this material.

MR. SCHWEIGERT: That is the other figure that is available, that approximately this amount is being sold. You can appreciate that companies are not now quite so reluctant to state that they are using these for their steaks from strip loins of cows of commercial grade. But the volume of these enzyme tenderizers is somewhat of an empirical thing anyway because the enzymes are not pure and the solution is formulated differently in different places. It is very small in the sense of the total beef production but quite significant with certain processor relationships with restaurants, etc., small establishments I think in the main.

MR. HENRICKSON: Bernie, is it a common thing to call it a flavorizer rather than a tenderizer among the commercial trade?

MR. SCHWEIGERT: Are you thinking of those that are being sold as meat tenderizers?

MR. HENRICKSON: Yes, the Flame down there on State Street refers to it as a flavorizer rather than a tenderizer.

MR. SCHWEIGERT: That is a new one on me. I have not seen anybody that stated on the menu or otherwise that they had a really special steak.

MR. HENRICKSON: I won't say it was on the menu but when we asked him about it he said it was a flavorizer.

MR. SCHWEIGERT: That is news to me.

How about any of you men?

MR. KASTELIC: They call it sodium glutamate.

MR. SCHWEIGERT: That is something different, of course. People's understanding of what is done is in need of great improvement. Sometimes the restaurant itself is doing it. I should mention this. They are not all bought from the packing plant, frozen and delivered to the restaurant.

I did not expect to get into this. We have three experts up here on enzymes. Does anybody have any new enzyme research or some problems or some concepts that he is developing at his institution that he would like to share with us briefly?

MR. HALL: I think that Mr. Sliwinski mentioned various possibilities of the use of enzymes as analytical tools. One of the things that we have been trying is selective use of enzymes for separation of various protein fractions, the protease which will attack one type of protein and avoid another. We have been attempting to use that to isolate or to disentangle connective tissue by a protease that will attack the other protein fractions in the meat and leave the connective tissue undisturbed.

This is one of the great difficulties in the attack on the collagen problem, that is, to isolate it from the other protein, particularly the water-soluble fractions which will eventually wind up with the gelatin fraction and give a high value for your exposed collagen.

MR. SCHWEIGERT: Excellent, Mr. Hall. Bob, would you like to add anything to that?

MR. SLIWINSKI: No, I don't think so. The only thing I can say is that this is a really good method, because I think right now the only way they are separating them is by histological methods, just separating the individual fibers.

MR. SCHWEIGERT: I could add that in some of our work histologically we have had some degree of specificity of certain enzyme preparations on either elastin or collagen or the muscle tissue fibers. But Mr. Hall is pointing out one of our problems, that the enzyme preparations we have are by no means pure and, therefore, the activity of any given preparation isn't all on one and none on the other.

Would anybody else like to make a comment?

MR. DEATHERAGE: I have no comment. I would just like an elaboration of a remark made by Mr. Sliwinski, questioning the usually accepted explanation for dark cutting. I should like to know what he is questioning.

MR. SCHWEIGERT: Well, you have your head in there now, Robert.

MR. SLIWINSKI: I know that this has been brought up with me before, but as I see it in a dark cutter you have less lactic acid produced; therefore, the pH remains high, and because of this high pH you also have -- in other words, let us put it this way: in dark cutters, I should not say in general but ordinarily you find a sticky texture to t meat, and the consensus is that it is due to the higher pH rather than some other factor which would be plausible, because increased pH with these proteins would make them more soluble and they would get that sti feeling. This has been refuted by a number of people and that is why I mentioned it was questionable.

MR. SCHWEIGERT: We don't always agree in our own laboratories as to what is going on in dark cutting beef, which is probably healthy. Fred, would you like to throw in a little philosophical explanation of it?

MR. DEATHERAGE: I am just asking for information, and I am afraid I am not getting it.

MR. SLIWINSKI: I am afraid I don't have it either.

MR. SCHWEIGERT: I believe that we are ready to turn the meeti back to Vern, and I want to thank these men and the other members of the committee for their fine suggestions. I think it was a very worth while program. Thank you. (Applause)

CHAIRMAN CAHILL: We thank you.

Should we take a stretch now?

(Recess)

CHAIRMAN CAHILL: I am grateful to you for your promptness in returning after these breaks. Before we get into the program, George Wilson, are you prepared at this time to make announcements concerning the short course?

(Mr. Wilson made some announcements concerning the short course.)

CHAIRMAN CAHILL: Thank you very much, George.

Going to the Personnel Committee, we are approaching a committee that probably has more contact with all of us throughout the year than any other group of the conference. I can assure you from personal observations that this has been a very active, hard working committee and I was also cognizant of the fact that at least one member of the committe has gone all out in order to make news for the next News Letter, when I read that letter from Jerry Wanderstock a little while ago.

Now I should like to turn the discussion on personnel activitie over to Professor Larry Kunkle.

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REPORT OF THE YEAR'S ACTIVITIES

L. E. KUNKLE
OHIO STATE UNIVERSITY

Since the committee has always been identified in a prolific way, I suppose we ought to admit that one of our good friends is defending his administration in the great University of Nebraska and could not be here. It is my understanding that Mr. Ellis is very busy with Mr. Benson in Washington, and it is taken for granted that Mr. Doty and I have the stick to carry here.

You will remember that a year ago we took the responsibility of trying to redo the first, the original personnel directory and I trust that those of us whose names appear in this publication, some 134 of us, all have a copy and have not filed it in No. 13. I suspect that some of them have gotten away, and I think that Ken Franklin is fortified with the necessary replacements in the event they will be useful.

It is implied, too, that the National Live Stock and Meat Board are the ones who furnished the necessary funds in order to make this kind of thing available, which has been paid for, and I trust that some of you will vouch for the fact that it was useful.

Then because of changes that were inevitable and changing change had to be changed, we tried to carry out the notion that there was opportunity for a News Letter. I suppose competition between Thanksgiving and Christmas is the best excuse as to why we did not fulfill that obligation, but we did send you a two-page News Letter, and we hoped in a rather subtle way that we could get some help from you.

Now, I don't know, parenthetically, Mr. Franklin, whether we should have enclosed some blank paper and a self-addressed stamped envelope, because this is an awfully subtle, quiet group. Anything that might appear in a future News Letter will have to come by way of the grapevine, and that does not seem to work very fast either.

At the risk perhaps of getting into the placement problem, we would remind you that there have been some additions to those who were identified by Mr. Franklin in the roll call this morning. This is strictly unofficial but I think can be verified.

W. E. Townsend, of Michigan State University, is now associated with Swift and Company's Fresh Meat Research Division, under the tender care of Mr. Paul Goeser.

Bob Dynes tells me that he is planning to leave Montana State and go down with Gene King and associates at Texas for a year and during his absence John Marchello will carry the responsibility at Montana.

I would also like to admit that Mr. M. K. Handy will be leaving Columbus, Ohio, to join that illustrious group of folks in food technology at Athens, Georgia.

I am suspicious that there may be other changes, but at the risk of an anticlimax to Mr. Franklin's previous announcement, I will propose tha any changes that are made known to the committee during this conference or before it adjourns will be assembled and put into a News Letter for those goo brothers who are not present. I think the sisters are here. We will try to get it mailed by July 1. That is a threat and a promise.

Now if there are needs for people or if people need jobs, I suppose we would like to know it. We have been deputized by one Mr. Ensminger, in spite of what was said in the News Letter of last March, to secure for him a meats man, and I think all of you in the room know that the address is Pullma Washington, in the event you are looking for a job or know someone who is qualified.

May I conclude this report, Mr. Chairman, with this statement: The old committee spirit has been good even though the flesh may have appeared to be weak. (Applause)

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CHAIRMAN CAHILL: Perhaps the moral is if you have some news or want a job or want someone to help you or you appreciate what the committee is doing why don't you tell them so?

We come now to a little change in pace. The program calls for the election of an executive committee. If you will look on the inside of the back cover of this program you will see the Nominations Committee listed, consisting of Al Pearson, Chairman, John Christian, J. R. Dynes, R. L. Henrickson, and Auttis Mullins. I wonder if we may call on you at this time for the report of your committee

MR. PEARSON: Bob Dynes, if you fellows will hand out the ballots at this time. I have some extra ones up here to hand out. We will pass out the ballots.

According to the Constitution there are three holdover executive officers who have served only one year and who are automatically placed on the ballot. Of these three you will vote for two. The names of the holdovers are Charlie Adams, Bob Deans, and Don Naumann. Of these three you will vote for two.

I might state also for the benefit of certain schools, including my own, certain institutions represented here today, that they are limited to five votes each. I think I have a list of those that have more than that many present: Kansas, Michigan, Missouri, Ohio, the Department of Agriculture, and the American Meat Institute Foundation, the Quartermaster Food and Container Institute, and Texas A. and M., I believ If those groups will get together and decide who is voting here, I think it will be helpful.

Five new names will be presented to the conference for consideration. Out of this group you will vote for three. The five new names which the Nominations Committee would like to submit for your consideration are:

Ernie Briskey
Fred Deatherage
Bob Ingram
Bob Merkel
George Wellington.

I hope that by this time there have been caucuses of the respective institutions to determine who the voting members of their delegations are.

MR. MACKINTOSH: Mr. Chairman, isn't there a possibility that this conference may be held at one of the institutions in 1959?

MR. PEARSON: I don't know about that possibility, because I think it has not been decided as yet.

MR. MACKINTOSH: I asked is not there a possibility.

SECRETARY-TREASURER FRANKLIN: There is a possibility of almost anything, Davie.

MR. MACKINTOSH: The point that I desire to make is that should that be so, it would be desirable, almost essential, in fact, that that institution be represented on the Executive Committee. Will it be possible at a later date to add someone from the institution should it happen not to have a representative on the Executive Committee?

MR. PEARSON: Under the Constitution it would not be possible to say that he was a member of the Executive Committee, but I see no reason there should not be a person from the institution to act in liaison with the Executive Committee and that would solve the problem. I think a person could work in liaison with the Executive Committee. I think it is certainly a good suggestion, Davie, and we thank you for it.

Now are there any nominations from the floor? If there are no nominations from the floor we would like to submit the names to you again.

The first group is Charlie Adams, Bob Deans and Don Naumann. Select two from that group. The second group is Ernie Briskey, Fred Deatherage, Bob Ingram, Bob Merkel and George Wellington. Select three from that group.

(Ballotting.)

CHAIRMAN CAHILL: With your consent we will proceed with the program even though we may be a little ahead of schedule. The next committee, the Membership Policy Committee, you will recognize as a new one this year. I should like to give just a word of background concerning this committee. I think our Executive Committee this year has inherited a situation. There has been some discussion throughout the years about the membership of this organization. About four years ago, the conference, in a period of growth, adopted a constitution and bylaws. In that constitution and bylaws membership is defined, and it also says that the Executive Committee shall comprise the Membership Committee. However, nothing is very definitely spelled out in the constitution and bylaws on which the Executive Committee can work. It is certainly not the intent of anyone to draw hard and fast lines or to eliminate any group of folks or individuals. But the question usually comes up, "What is the mailing list of this organization?" The situation was just one of being a little loose, and we appointed a committee, a quartet of oldsters who could spend a year thinking about the problem and bring in some report to us, so that the group in conference here could think about it and, if it desired, possibly take some action.

Mr. Bob Bray, of Wisconsin, has been earmarked to bring the committee's report. We will call on Bob at this time.

MR. BOB BRAY: Thank you, Mr. Chairman.

I have often wondered how many years it would take to get to be an oldster, and I have finally arrived.

CHAIRMAN CAHILL: Eleven years.

MR. BRAY: I think that Vern has pretty well summarized what the problem is here, as I understand it, and that it is one essentially of growing pains. We have grown from a group where each of us could call each other readily by name to a group today where I have trouble calling maybe half by name, I am sorry to say, and I suppose membership has come just merely by attending the conference or signing one's name and, again as Vern has put it, in a rather loose manner.

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MEMBERSHIP POLICY COMMITTEE REPORT

R. W. BRAY

UNIVERSITY OF WISCONSIN

This Committee was set up by your Executive Committee to study the membership policy as set forth in Article III of the constitution. Article III reads as follows:

> "Membership shall consist of persons engaged in teaching, research and/or extension in the field of meats and meat production, and shall be limited to the following:
>
> A) Individuals on the staff, including those enrolled as graduate students, of animal husbandry departments at colleges and universities.
>
> B) Individuals employed by related departments in colleges and universities, as approved by the Membership Committee.
>
> C) Individuals employed by the United States Department of Agriculture, the National Live Stock and Meat Board, the American Meat Institute Foundation, and the Animal Products Division of the Quartermaster Food and Container Institute."

Each member of the Reciprocal Meat Conference received a letter dated May 15, 1958, calling attention to the contents of Article III and to By-law No. 2 which states that the Executive Committee shall serve as the Membership Committee. In addition, several proposals concerning qualifications for membership and of type of membership were set forth.

It should be made clear at this point that this Committee is in agreement with the broad terms already established in Article III; however, the Committee believes that a standard procedure for accepting or rejecting prospective members should be more clearly defined.

The Committee discussed the advisability of accepting members in line with their specific departmental assignment; such as Animal Husbandry, Food Technology, etc., and/or on an individual basis. Granting that accepting members on a group basis could be rather specific, it was felt that this method would not satisfy every case, thus the Committee recommends that membership be determined upon each individual's qualifications. The Committee recommends further that the Executive Committee prepare an application form for membership. The application should carry the endorsement of a Conference member and be passed on by the Executive Committee.

It is suggested that the form request information as to activities of meat research, teaching and extension, and the percentage of time the individual spends in these endeavors.

An annual review of the membership should be made by the Executiv Committee to eliminate those no longer working in the field of meats.

If the above recommendations are accepted, the extent of the current membership needs some clarification. The Committee recommends that th current membership list include all those in attendance at the 1956, 1957 a 1958 Conferences and are full-time employees of university or college depar ments of organizations as listed in Article III of the Constitution. In formalizing the membership of this Conference, it was felt that some provis should be made for those attending the first Conference, but have since retired. Therefore, the Committee suggests that all those in attendance at th first Conference in 1948 should be recognized as charter members. Often gra ate students, upon completion of their work, obtain employment with organiza tions that are not invited to the Conference; therefore, the Committee feels that graduate students should be accepted as associate members if they have a major interest in meats. Graduate students upon completion of their gradu ate program will make application for regular membership. The Committee rec ommends automatic associate membership to those in attendance at the 1957 an 1958 Conferences.

The Committee recommends that guests be invited on an annual basis with the approval of the Executive Committee.

We certainly appreciate the time, money and facilities furnished this Conference by the National Live Stock and Meat Board. The Conference, however, has certain expenses which its membership should take care of such as memoriams, retiring chairman's gavel, postage, etc. This Committee recommends the collection of an annual membership fee to be used for this purpose. The suggested annual fee for current members is $2.00 and $1.00 for associate members.

The Committee was asked to consider a policy for the distribution of the Conference reports and the notification of annual meetings. The Committee recommends that copies of the Proceedings be sent to current and associate members irrespective of attendance at the Conference, and that notification of Annual Conferences to current and associate members and guests be the responsibility of the Executive Committee.

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MR. BRAY: Is there any discussion regarding the comments that I have made?

MEMBER: Do you mean that to go into effect as of next year?

MR. BRAY: As of whenever it is voted on, if that is now or next year.

MR. KUNKLE: Do you want a motion?

MR. BRAY: I was only to go as far as discussion. If we are ready for a motion, I will turn the meeting back to Mr. Cahill. Is there any discussion before we do that?

MR. SULZBACHER: Bob, will you just summarize before you sit down what will be the qualifications for membership if your suggestions are approved?

MR. BRAY: Let me get to the specific point. On the application form all that would be asked would be the name of the applicant, to be endorsed by a conference member, and the form would have to carry information regarding his work, whether it be research, teaching or extension. We did not place a minimum percentage of time that he should spend in the area of meats. We left it to the Executive Committee to decide whether or not the individual should become a member of the conference.

MR. SULZBACHER: Would this then offer to membership, for example, a person doing research in meats who is not covered by the present provision of Article III, that he be a member of an animal husbandry department or associated with a department of a university or certain other institutions?

MR. BRAY: I cannot think of a case, but you probably have one in mind. We think it would cover everyone. Perhaps it won't. It is our thinking that it would cover anyone who is interested in the area of meats.

MR. WILSON: Does it cover somebody from industry?

MR. BRAY: No.

MR. WILSON: You have not excluded them, have you, by that statement?

SECRETARY-TREASURER FRANKLIN: The constitution covers that.

MR. KUNKLE: How about associate members? How would you spell that out?

MR. BRAY: Let me read what we have said here to be exact. All we said is that the committee feels that graduate students should be accepted as associate members, if they have a major interest in meats, and if they attended in 1957 and 1958 they will automatically be associate members. After this date application for membership will have to be made as for any membership.

MR. KLINE: Bob, may I ask one question. Suppose now that this were accepted and a new graduate student came into an institution in the fall, in September, would his application be acted upon so that he would be eligible to attend the next conference or how long a time would be necessary for action to be taken on the application?

MR. BRAY: Well, from the list of names over there, I think those men will act very quickly. I think it will be handled all right.

CHAIRMAN CAHILL: Perhaps a word of explanation here. We hav done a little thinking about this, Ed. Perhaps the Executive Committee or whichever members of the committee they choose to act as this judici body could meet in November and possibly again during the conference. That would be twice a year to act on these applications. In November we would pick up the graduate students who would start in the fall and make them full-fledged members for the following January to December year.

MR. HAVENER: Mine is really just a technicality. I wonder whether that term "graduate student" needs further definition. I am thinking primarily of people who are full-time staff members but graduate students. Does that need to be interpreted?

MR. BRAY: I think you would fall under the staff category.

MEMBER: How would that apply to attendance by an administrative officer of one of our schools, should he be available for this conference or any other conference?

MR. BRAY: He would be a guest.

MEMBER: Would he have to have a written invitation from the Executive Committee?

MR. BRAY: I would think if you wanted him to come you could ask the Executive Committee to invite him.

MR. WILSON: I don't know, maybe this is the way you intended it and maybe this is the way you want it, but it seems to me that actually one of the issues that has come up is the matter of whether -- bless their souls -- we want the home economists in the group or not, and I believe, if I interpret your recommendations correctly, it will be up to the five people elected here a few minutes ago to decide whether or not we have home economists, agricultural economists, and so on down the list. As I would picture it, this Executive Committee for the next year would actually determine the policy not for this year but for all subsequent years. Is that right?

MR. BRAY: I suppose that is correct. Under Article III (b) individuals who are employed by related departments of colleges and universities can certainly be members of this conference, and I suppose you are right. The policy that they establish will be the one that is carried on, but it is pretty hard for me to believe that the Executive Committee representing this group would want to narrow it any further than we have even at the present time.

I think that they have been welcome up to this point; I suspect that they will be welcome in the future as well.

Let me ask our good chairman of the committee, Lyman Bratzler, if he has any comments regarding this. I am just one of the peons on this committee.

MR. BRATZLER: Well, to my mind, now that George brings up this matter of the Executive Committee's setting the policy, I suppose they could, but with our turnover I am sure that they would be very susceptible not to any pressure but lobbying, let us say, or any suggestions that would be worth while. We have not really considered that at all, George. That never entered the thinking, but I think it is well that it has been brought up.

MR. WILSON: Maybe this is the way you intended it and maybe it is the way you prefer it. My only point was that if this conference here as a group is willing to let the Executive Committee make this policy decision, which I view as such, then it is quite all right, if it is the feeling of the conference as a whole. On the other hand, if the conference as a whole feel that they should have a vote in this rather than five representatives, then I think it should be clarified.

MR. BRAY: Well, our bylaws clarify the point, George, that the Executive Committee is the Membership Committee, and unless we change that, I think that is the way it will stand.

MR. ADAMS: Bob, this will be on a year to year basis anyway and if someone should be taken in by the Executive Committee who is not desirable, it certainly should not be too much of a problem for the next Executive Committee to reverse the decision.

MR. BRAY: I don't think that we want to get into that type of situation.

MR. ADAMS: No, but that is a possibility.

MR. WILSON: That is my point, Charlie, it won't work that way. It won't be reversed.

MR. SULZBACHER: I think that what Charlie has implied is something that ought to be considered. One -- I should like to call him a member of the conference -- spoke to me about this last year because he has been spoiled by working for industry and he is now what they call persona non-grata, and apparently they must be operating under Article III, a sort of implication that we do get rid of people.

I am rather inclined to think that your first remark, that the committee thought that handling this on an individual basis is much better than on a group basis might be implemented and carried quite a bit further than you have done it and it might be possible for some new thinking to be thrown on Article III and for distinct qualifications to be set up for individuals to become members and for people to be considered entirely on the basis of their individual activities and not what institution or what department they happen to be connected with. That it seems to me would get rid of the continual source of argument and discussion that might always occur.

MR. BRAY: Well, I don't know if everyone understands why. I didn't write Article III, but I think that we all had a chance to pass our opinion on Article III when it was originally proposed. As I recall, our thinking went about like this: The group is getting large and to try to keep it down to a working size we have to place some limitations as to who should be members. I think that is why that was done. Is that right, Bill?

Now it is not up to me to decide this. I think we can turn this over to the conference to decide if they want to rewrite this. All we were asked to do was to provide a method by which we could bring in new members in a more organized fashion and that is what we have attempted to do.

MR. HALL: It seems to me that in all this talk the thing that is causing some uncertainty is whether membership depends on the person's individuality or on his official connection. Official connections can change from year to year. Whether that will have any affect on the membership or not seems to be the point.

MR. BRAY: All I can answer is yes, it will, if he goes with a meat packing firm, for example, some packer, the way our constitution now reads.

MR. SCHWEIGERT: Or if his level of effort changed so that he was not in meats research, there would have to be some mechanics for consideration of that.

MR. BRAY: Yes, that is not in here. If he did not have any further interest in the meats work he probably would not be interested in paying the annual fee.

MR. BRATZLER: I might say, in answer to Bill's remarks, if you ever try to get out a mailing list from the list of members that we now have, it is quite a chore. Larry Kunkle over there is just bobbing up and down agreeing with me, and that is one thing that I think this membership will establish. At least we will have a mailing list and know to whom to mail the various things.

MR. SULZBACHER: I appreciate that, Lyman. I am heartily in favor actually of your provisions. The only thing is I think that they might go a little further.

MR. BRAY: Anything further?

MR. SNYDER: Mr. Chairman, I make a motion that the report as read by Bob Bray be accepted.

MR. SCHWEIGERT: I second the motion.

CHAIRMAN CAHILL: The motion has been made and seconded that the report of the Membership Policy Committee as presented by Mr. Bray be accepted.

MR. ANDERSON: I will second that, Vern.

CHAIRMAN CAHILL: Thank you, Professor Anderson.

It has been moved and seconded. Is there discussion? The question has been called for. All those in favor please signify by raising their right hands; opposed the same sign. Apparently it is a unanimous decision. (Carried)

Thanks very much, Lyman and your committee, for this report.

I realize that we are going to have to be somewhat tolerant during this first year, especially with the new Executive Committee. I am certain there are things that will come up that we as a group have not foreseen. It will take a great deal of thinking on their part. I know that they will welcome your suggestions if you will but pass them on to them.

Now we come to the part of the program that is not listed on the program. It is being offered now by popular request. It has to do with invitations for a meeting place for the 1959 meeting which we have not decided will be any place other than Chicago. But just in case this group decides to move, the Executive Committee wants to have some possibilities to suggest. We have here a file of invitations from several institutions. Some of these institutions have requested an opportunity to elaborate on these written invitations and so, as I announced this morning, we will take this time for it.

I don't have a better way than perhaps to go down this list alphabetically and allow a minute for each institution to make its pitch, as it was explained to us.

First on the list is the Clemson Agricultural College. Is there a representative here of that institution? If not, may I fill in? We have a letter from M. D. Ferrar, Dean of Agriculture, at Clemson. Just highlighting it, in 1955 they completed a new agricultural center which includes the most modern facilities for holding such conferences. They have a modern meats laboratory and an auditorium in conjunction with the laboratory where all types of meats may be taken directly from the kill floor or the adjacent cold storage room. The plant and the animal science building, which is only a few steps from the meats laboratory, is a thoroughly modern building, having classrooms, officers' conference rooms, and an auditorium with a seating capacity of 300.

He goes on to say that with a little advance notice they could handle the conference at almost any time with the exception of the week of August 15.

The one minute is up.

Over there is a little literature that Clemson sent telling you what the housing facilities are there.

Next along the line here is the University of Florida. Zane, do you have anything that you wish to add?

MR. PALMER: I have nothing in particular to add to the invita tion other than that we will be pleased to have you. We recognize that we are not as centrally located as many people, but nevertheless you wil be most welcome and we will try to do a reasonable job for you.

MR. PEARSON: How about scheduling it for January? (Laughter)

CHAIRMAN CAHILL: Thank you, Zane.

Next is Fresno State College from Lloyd Dollar, Dean of Agricul ture.

"Please consider this a formal invitation to hold the next Reciprocal Meat Conference on the campus of Fresno State College. We have the necessary instructional facilities to carry on such a conference, and I am sure that we have excellent housing accommodations at our hotels and motels to take care of such a group. We were hosts for the National Angus Conference this year, during the month of March and had approximately 300 people in attendance at this meeting."

Here is another sentence: "Fresno State College is centrally located and, as you perhaps know, Fresno county is the richest agricultural country in the United States.

Now if we may have your attention and turn to the University of Georgia, we have as our guest here Mr. Bob Long, head of the department there. Do you have something to add, Bob?

MR. LONG: Mr. Chairman, first I should like to apologize for my uninvited presence here. (Laughter) Since I am not actively engaged in meats research or teaching, after the motion that was just about unanimously approved I feel like slinking across the room. (Laughter)

Nevertheless, I do wish to invite you wholeheartedly to the University of Georgia next year if you desire to come. I think that we can assure you that our facilities -- maybe I should not make quite this statement but I think I can say that they are at least second to none. In our new center for continuing education is a very modern air conditioned building which I think you will find satisfactory, and the food, etc. There will be plenty of grits and gravy available.

The reason I am personally interested is because we have had very little emphasis on meats work, and it means so much to our teaching and our research program, and I think the presence of a group of this stature would have a tremendous impact on our administration and make them realize the importance of additional emphasis in this field.

CHAIRMAN CAHILL: Thank you.

There are some pamphlets here illustrating the facilities available down at Georgia.

Don't feel a bit awkward about being here, Bob. If any of these men had the opportunity to live with you and to eat your cooking as undergraduates, I am sure they would want you in the meats family.

MR. LONG: Thank you, sir.

CHAIRMAN CAHILL: The University of Illinois. Is Burdette Breidenstein here or another representative?

MR. BREIDENSTEIN: I don't have a great deal to add to the invitation already presented. We do have facilities for meals and we do have an air conditioned alumni union that will seat participants in much the same manner that we are seated here.

CHAIRMAN CAHILL: Now we turn to our distinguished friend from Kansas State College, Davie Mackintosh.

MR. MACKINTOSH: I think you had better read the letter. I didn't see it in its final form. (Laughter)

CHAIRMAN CAHILL: Very short and to the point.

> "Thank you very much for your letter concerning plans for the 1959 Reciprocal Meat Conference.
>
> "On behalf of Kansas State College it is my happy privilege to extend to you, as Chairman of the Conference, a cordial invitation to schedule the 1959 meeting at our institution.
>
> "We have just completed a new animals building which contains one of the outstanding meats laboratories in the nation. There are excellent facilities available for meetings and demonstrations. I am sure that the Reciprocal Meats Conference participants would be pleased with the arrangements that we could provide.
>
> "If you have any questions concerning any of the facilities in Manhattan either at the college or in the city, I shall be glad to try to answer them.
>
> "We sincerely hope that the 1959 conference will be held at Kansas State College.
>
> "Sincerely yours,
> Arthur D. Weber,
> Dean of Agriculture"

MR. MACKINTOSH: He made one omission. We expressed preference for a date later than '59. We thought that in '59 we might not be as ready as we would like to be. We suggested after '59; so we will not be contenders for next year.

CHAIRMAN CAHILL: Was that audible in the rear of the room?

Michigan State University.

MR. BRATZLER: All I can say is that we would very much like to have the group there and we will do our best to live up to the caliber of facilities we have had. We will let you folks present the meeting. We will do the leg work and we will try to make you very welcome. We cannot guarantee any fish. We have some pretty good looking, shapely coeds enrolling for the summer school, and we have the Red Ceda river, and you are very welcome at Michigan State.

MR. PEARSON: And a sewage disposal plant. (Laughter)

CHAIRMAN CAHILL: Going from enzymes to bacteriology.

The University of Missouri, Don Naumann.

MR. NAUMANN: We should like to invite you people to come out to Missouri next year. We are located pretty favorably for the rest of the country. We have made arrangements for air conditioned meeting rooms and banquet rooms, and we have dormitory facilities available for those of you who would like to stay in non-air conditioned rooms.

We were hosts for the poultry science group a couple of years ago, and our facilities were very adequate.

We suggest to the conference that the short course might be on consumer preference methodologies.

Also we should like to say that we think we have a fairly decent laboratory, and we certainly welcome you to come to Missouri.

CHAIRMAN CAHILL: We are certainly proud of the way you folks are condensing your statements.

We have a letter from Dean Lambert, of Nebraska. Is there anyone here who would like to speak for Nebraska?

MR. ADAMS: I am not through with Michigan yet.

We should like to invite you out to the University of Nebraska We have a fairly new meats laboratory there. We have excellent meeting facilities -- air conditioned rooms.

Since it is vacation season, we have very nice entertainment there in the city of Lincoln for your wives and families. Capital Beach has about the only salt water swimming pool in the Midwest.

CHAIRMAN CAHILL: We come next to North Carolina State College I suspect Mr. Tom Blumer will handle that.

MR. BLUMER: I think one of our qualifications to hold the conference in North Carolina is that we can handle a group of this size, and proof of that is in evidence now. The Dairy Science meetings, with over 1400 in attendance, are now in progress; so I think we could handle 150.

We have in the air conditioned students' union building a room larger than this. We don't have air conditioned bedrooms for you to sleep in, but it cools off at about five o'clock at night. (Laughter) On the western side of the state are the mountains and on the eastern side is the seashore, and we are in between. We are in the Piedmont district. So you would have a rather large selection of vacation land while you were there.

We welcome you to our institution.

CHAIRMAN CAHILL: One of the bedtime conversations last night before dropping off to sleep was the difference between how folks from other countries are treated as tourists in the United States and how United States citizens are treated as tourists in other countries. We have a perfect example of that. If anyone comes from across the border to the United States he has to have sanction from Washington to travel and visit certain places; yet we have a very nice invitation from Professor Stillwell and his group up at Ontario. Professor Stillwell is here. Would he like to make any further comments?

MR. INGRAM: Well, Canada seems to be a special playground; so I should like to invite you to come up and play around. We do have the facilities, incidentally, up there, and we would certainly look forward to entertaining you.

CHAIRMAN CAHILL: Thanks, Bob.

The next letter is from Purdue University. Is there anyone here from Purdue? This letter comes from Dean Butts and one paragraph reads:

> "If you should desire to come to Purdue University, we would, of course, be very happy to have you here. We think we have excellent facilities for a meeting of the kind you have, both from the standpoint of accommodations and meeting rooms."

He goes on to point out that they have not been particularly active in meats work but hope to become so.

South Dakota State College. A name is mentioned in this letter.

MEMBER: I didn't extend the invitation; so will you read the letter, please?

CHAIRMAN CAHILL: I am very glad to do so. It comes from Mr Mussen, head of the animal husbandry department. Dean Eberly asked hi to reply to our letter, and he goes on with this paragraph:

> "We are happy to offer the facilities of South Dakota State College, at Brooklyn for the June, 1959 Reciprocal Meat Conference.
>
> "Bob Saffle, now in training at Michigan State, is coming with us this September and should be on hand by the 1959 Conference.
>
> "In fairness to the committee which finally makes the choice of the institution, I must say that our meats laboratory facilities here at State College are not very good. As far as meeting rooms, housing facilities, and meals are concerned, we are amply well prepared to take care of those needs."

Is there anything further from Mr. Kamstra or Mr. Saffle?

The University of Tennessee. I believe that is located down in Knoxville. Is Bill Cole here today?

MR. COLE: That is right, and we should like down our way to have this conference "Make it Knoxville time in '59." (Laughter and Applause)

We will be mighty proud for you all to come down and find out that there are some ordinary folks besides Tennessee Ernie and Elvis Presley and three vice-presidents, Democrats, that is. Also that Bill Cole is doing something besides barbecuing on the side.

They are distributing to you maps which are done in millimeters and will show you that Knoxville is closer to 17 states than is Chicago, and if you compute the millimeter distances on the Rand-McNally map you will find that the distance to Knoxville is very little greater than to Chicago. In fact, if you did a statistical analysis on it, I am sure it would not be significant.

We are now completing a million dollar air conditioned animal science building which is in connection with our meats laboratory which, of course, will handle the meeting very well, with conference rooms and what not.

And the Chamber of Commerce says: Down in the mountains, the great Smokie Mountain air, the Great Lakes of the South. The University of Tennessee is mentioned and Oak Ridge Laboratory which some of you might want to visit.

Also I am sure that if any of you are contemplating families, Tennessee is the place in '59. Make it Knoxville time in '59. (Applaus

CHAIRMAN CAHILL: Everyone has his literature. May we proceed to Texas A. and M. I believe that Gene King will handle that.

MR. KING: I don't want to hear this conference ever refer to Texans as being the outstanding braggarts of the country because I sure can't compete with Bill Cole. But I do extend to you a sincere, heartfelt invitation to Texas, and I am without any commercial propaganda to pass out.

We can house you, the conference, the sleeping rooms, and everything, in one building, in our Memorial Students' Center which is air conditioned. We can handle not as many as some of you have mentioned. We can handle up to 500, I guess. The dining facilities are in the Memorial Students' Center.

Also we can handle the short course.

We can provide entertainment if you wish. Maybe not what you will find here in Chicago or Knoxville, but we can furnish a trip, which I think is very educational, down the ship canal to Houston with probably a meal served at the end of it. A tour of the King ranch is a possibility for some of you; for others it would be old stuff. Also a rodeo, if you would like. Certainly an entertainment program for your wives, if you desire to bring your wives and families along. I am not contemplating a family deal; so I am not going to mention that.

CHAIRMAN CAHILL: Next we come to a letter which includes this paragraph:

> "I am, indeed, pleased to be able to formally emphasize by this letter my earlier oral invitation to the conference to meet at Beltsville either in 1959 or at any future time."

Signed Bill Sulzbacher. Do you have anything further?

MR. SULZBACHER: Well, Vern, I just can't express how pleased I am to hear all these invitations, and I hope that in future years we will visit all of these places. I am not here to sell Beltsville, although I might reply to Bill Cole and Gene King and say that Washington is still the No. 1 tourist spot in the country.

If you folks should wish to meet at Beltsville, we can take care of you, and that is about the extent of what we have to offer.

CHAIRMAN CAHILL: Thank you.

Now we come to the last in the alphabet but not least by any means. We have a letter here signed by our own associate, but it was followed by a letter from the president, the dean, and the head of the department at the University of Wyoming. Carroll, would you care to elaborate?

MR. SCHOONOVER: Just one thing about having the conference in the West. I do believe that the conference held some place in the western states would do much to stimulate the thinking and interest in meats work in the area. At the present time many of the schools are doing meats work. Often times it is being done by other department members. Possibly this would help to show the need for meats work in some of the western schools.

I think our facilities are adequate. We have a good size meeting room, adequate for this size group. As far as air conditioning is concerned, our whole campus is naturally air conditioned. (Laughter

Thank you.

CHAIRMAN CAHILL: Are there any other statements pertaining t this portion of the program?

MR. SULZBACHER: Vern, seriously I should like to say that if the conference should decide to meet at some place other than Chicago, I think it would be helpful if we met in some midwestern state because i would certainly be easier, and with all due respect to our friends from California, one of the things that we have talked about in the past is that if we ever did move out of Chicago it might be a problem for a lot of people to travel. For that reason, although my invitation still stands, I am inclined to favor places like Michigan, Illinois, Purdue, and those places that are more or less easily reached or equidistant from most of the United States.

MR. BLUMER: Other than selfish reasons I am wondering just why we want to move this conference out of Chicago. That is, what can we do at these institutions that we cannot do here? I am not at all clear in my own mind that we can do as good a job at an institution as we can here.

CHAIRMAN CAHILL: Thanks, Tom.

Let's take one more comment and then I should like to offer an explanation as we close it off.

MR. WELLINGTON: Mr. Chairman, partly in reply to Tom's remark, I feel that the first conference we attended was one of the most stimulating conferences we have ever had, and it was largely because we had other people's experiences, we really had a rundown on how beef work was being done at different institutions. I am strongly behind the idea of moving from Chicago to the campuses, because I think we will pick up a great many intangible things in visiting these campuses and seeing how the meats work is carried on.

I should like to support what Bill has said, too, that for the first conference away from Chicago, if we choose to do this, I think there are some pretty strong arguments for sticking to a place that is i the general area of Chicago, not necessarily a bordering state. I think that we should also give consideration to the size of the meats staff. I have had a bit of experience in holding conferences on our campus, some large ones and some smaller ones. It does require a bit of leg work. I think it would be well to have the school that takes it on have two or more full-time staff members in the meats field.

I look forward in the years ahead, however, to visiting all of the schools that have the facilities to handle the conference.

CHAIRMAN CAHILL: Thanks, George. If I may summarize a little and possibly bring some history in. The Executive Committee realized a year ago that this idea was being promoted, and so at the November meeting we asked Ken to carry the idea to Mr. Neumann and the Board for their reaction, realizing full well, as Tom has said and others have been thinking, that we owe a great deal to the National Live Stock and Meat Board and the Chicago location. They, as we told you in the original letter, were heartily in favor of the idea. They didn't say yes with reservations; they said go ahead. They would like, however, to keep in close contact with us and we certainly want to keep in close contact with them which might be accomplished through some sort of alternate scheme meeting here every other year or on some such basis.

We wanted to get this information to you by letter before coming here, so that it would not be a snap judgment one way or the other, so that you would have time to think about it. The reason for displaying these invitations and giving you the information you have heard from your colleagues today was to add to your storehouse of information; so that you could think about it and discuss it tonight and then in the business meeting tomorrow make an intelligent decision.

We knew, too, or thought beforehand that if the conference decided to move away we would have to have some definite suggestions to make as to where to go and how it could be handled.

That is the reason for some of this preliminary background work. If you decide to stay here I would say that we have enjoyed it enough so far that nothing is lost. If you decide to move, then I hope we have things ready to go into action.

Remember the two committee meetings to be held immediately after this session. Are there other announcements?

MR. KEMP: I should like to ask exactly what the role of the Meat Board would be if we moved, if there would be any change, finances, and so on.

SECRETARY-TREASURER FRANKLIN: I guess I had better answer that one. As far as the Meat Board is concerned the status would be completely unchanged. We would continue to finance what portions of the meeting we have in the past. I or some other Board member certainly would continue to carry on as we have done and would work in liaison with the institution to which you went.

I think Vern made apparent that we feel that if you choose to move, at least for the first few years it would be a good idea to move in alternate years. But as Vern said, we are wholeheartedly in agreement with the idea because we can see now the benefits of such a move. Five years ago perhaps that would not have been true. But certainly this conference is well established. It is on its feet. It is a recognized body, and we are back of it financially and otherwise. Unless you thro me out, I will be there.

MR. BREIDENSTEIN: There is one other thing to be said about this. At least in our institution the cost to the Board would be considerably less because there is no cost for meeting facilities or anything of that kind. I trust that is true of all the institutions. Certainly this room does not come free. That should be considered, it seems to me.

SECRETARY-TREASURER FRANKLIN: In addition to that, unless we go broke all of a sudden, we will continue to have the banquet at the close of the session as we have in the past. You would still get a free meal. (Applause)

CHAIRMAN CAHILL: I believe that we have enough information with which to do some thinking tonight, and there will be opportunity tomorrow during the business meeting for further discussion.

We are going to hold the announcement of the election of the Executive Committee until we have all the other announcements out of our systems. Are there any others from the floor?

(Announcements of committee meetings.)

CHAIRMAN CAHILL: And I should like to remind you that the session starts in this room tomorrow morning at eight o'clock.

Now may we turn the meeting over to Al Pearson who has tallied the votes.

MR. PEARSON: Bob, if you will come up here I think we can just erase the names as we find out who the new officers are.

The holdover officers whom it was your pleasure to retain are Charlie Adams and Bob Deans. The new officers are George Wellington, Ernie Briskey and Bob Merkel.

That is the report of the Nominations Committee. (Applause)

CHAIRMAN CAHILL: We stand recessed at 4:59 until tomorrow morning.

(The meeting recessed at 4:59 o'clock.)

# # # # # # # # # #

TUESDAY MORNING SESSION

JUNE 17, 1958

The meeting convened at 8:00 o'clock, Chairman Cahill presiding.

CHAIRMAN CAHILL: I wonder if we might open the second day of our conference. I think the remarks I have to make are just like those of a minister: they are directed to those who are not here as yet this morning, and that is, Mr. Chairman, of this Lamb, Veal and Calf Carcass Evaluation Committee, you have a course down there at VPI in which you teach how you organize your work and get things done promptly. I should like to come down and take the course.

It seems that a letter went out from this chairman and it resulted in a letter coming back, and the committee members, I am sure, must feel that there was organization. I think Mrs. Caplin has a paper from every member of this committee to include with the proceedings. So let's turn the program over to this group and learn what they have to tell us about this lamb program that is now being carried on.

MR. KELLY: Thank you, Vern.

In considering a timely topic for this committee's presentation this year various and sundry subjects were considered. Needless to say, most of the subjects suggested by your Executive Committee and the Lamb, Veal and Calf Carcass Evaluation Committee seemed to center around the subject of lamb. Whether we should regard this as an omen of some sort or not, I am not prepared to say. However, it should be pointed out that at present the committee felt that the subject of veal and calf carcass evaluation has been quite thoroughly explored at previous conferences. I might also add that there appears to be very little interest in veal and calf studies. Perhaps the members of the Reciprocal Meat Conference need to look into this matter more deeply.

The fact that lamb is not a habitual meat on most American tables is well known. Another fact closely related to the former is that in spite of a great deal of promotion lamb production seems to keep on falling; therefore, the committee felt that this problem could stand discussion by the group. With this in mind, we have decided to present to this conference some efforts that are being made to promote the consumption of lamb on the national and state levels.

We are very fortunate this morning to secure the services of the American Sheep Producers Council's representative, Dick Biglin, who is a graduate of Creighton University and has had experience in the newspaper and radio field. He will present the work that is being done in the national lamb promotion program. I am sure that we can all profit from the experience that Dick will now share with us.

MR. DICK BIGLIN: Thank you very much, Mr. Chairman.

A NATIONAL LAMB PROMOTION PROGRAM

DICK BIGLIN

AMERICAN SHEEP PRODUCERS COUNCIL

It is certainly my pleasure and privilege to be here and partici in the Reciprocal Meat Conference. This is one of the many worthwhile ev sponsored by the National Live Stock and Meat Board to promote the livesto and meat industry.

It would be difficult to give you all the details of the promoti and advertising program of the American Sheep Producers Council. But, I wi give you as much information as possible about what I consider one of the most interesting--and we hope successful--programs ever developed for an ag cultural industry. Much has been accomplished, in the brief period of the Council's existence, to start the ball rolling toward an expanded demand fo the sheepmen's products, lamb and wool. There has been much toil, and we h had our share of trials and troubles, but now the program is functioning fu blast and producing some desirable results.

Let me review, just for a moment, the background of the Council; t I will tell you about the promotion program. The Council was authorized un Section 708 of the National Wool Act of 1954. The Wool Act, as you know, pr vides for an incentive payment to wool growers to encourage increased wool production. The Act, incidentally, is up before Congress for renewal at pre ent. Section 708 was activated after the Secretary of Agriculture conducte a nationwide referendum among sheep growers to determine if they favored the establishment of a promotion organization. The sheep producers voted in fa of such an organization as a self-help measure, a sincere desire on the par of sheep producers to do something for themselves by finding markets for the anticipated increase in wool and lamb production. It is the only way he co logically hope to put his industry on a sound basis for the future.

The Council, therefore, was formally activated on September 12, 1 by representatives of various segments of the sheep industry. Active promo and advertising work did not begin until early in 1956.

The Council is financed by a deduction from incentive payments un the wool act -- one cent for each pound of wool sold or five cents for each 100 pounds of lamb sold. This deduction makes up the promotion and adverti ing fund amounting to from 2½ to 3 million dollars a year.... an adequate but rather small compared to some promotion funds.

The American Sheep Producers Council is charged with the responsi bility of using these funds to obtain the best possible results in promotin the sheepman's products, and ultimately to provide a more stable and equita price for producers. The program must progress slowly but steadily in keep with existing production. Nature cannot be rushed, it takes time to expand production, and we are very encouraged to note that there was a 2% increase breeding ewe numbers last year--the first increase since 1952. This indica a renewed optimism in the sheep industry.

The American Sheep Producers Council, which is not a government organization, is supported and governed by sheepmen. Its 137 delegates, representing every sheep producing section of the country, select a board of directors from their members. It is this 39-member board which approves budgets and puts its stamp of approval, or disapproval, on all programs developed. Trained personnel in merchandising, advertising, administration and publicity direct the actual operation of the program as approved by the directors.

That, very briefly, is the background of the Council. Now, how does it operate; what is the design and pattern; the goals?

We do have a wool program, the largest in the history of the sheep industry. This program is conducted in cooperation with the Wool Bureau and other allied wool agencies. Advertising of wool is done in national consumer magazines, such as Sports Illustrated, Life and several national women's publications.

Wool, of course, is a universally accepted quality product, although hard hit by synthetics the past few years. But, let's talk about the lamb side of the picture.

Lamb has been somewhat of a problem meat for years. The latest figures show that lamb consumption is about 4½ pounds per capita. This decline in per capita consumption over the past fifteen years can be attributed to a number of things, basically a decrease in production and an increase in population. For example, wool prices had been frozen throughout World War II while production costs rose 65%. The tight economic squeeze continued after the war's end. Feed, labor, land, equipment, marketing and transportation costs continued to skyrocket. Rising cost of production on one hand and competition from low cost wool producing areas of the world on the other hand, held down income of the American producer, forced many sheepmen out of the business and caused others to cut down their production. From 1942 to 1954, the sheep population dropped 45%.

How did the Council start its program? Fortunately, we did have something to go on, a study by the Institute for Motivational Research, which makes use of depth interviews. Here are just a few of those problems for lamb revealed in the study: 1) Lamb is almost an unknown quantity in many sections of the country, particularly the Midwest and South. 2) Lamb, to some people, carries with it the concept of being a delicate feminine food, very ideal for librarians. 3) Even in high lamb consuming areas, many persons know only about the legs and chops. 4) Lamb has had no middle ground in price...it was either high, in the Waldorf-Astoria class, or low, a distress item. 5) Lamb is for the very young or the very old, a health food, a term which, believe it or not, sometimes has an adverse reaction. 6) Lamb is a seasonal meat. 7) The detrimental influence left by war veterans who had an undesirable experience in eating mutton in the service.

Those are a few of the reactions of consumers, yes, and even meat retailers in some instances. Needless to say, the Council had a job on its hands. It definitely called for a program of education...beyond the general concept of advertising. People not only had to be told and reminded of lamb, they had to be shown how to prepare and serve it. Here was a meat that had been allowed to seek its own course, drawn to where there was demand and being virtually unknown in those areas where there was little demand. That is why today more than 70 percent of the lamb is consumed in six states--Ne York, the New England states and California. Lamb, in fact, is eaten in th very areas where it is not raised--with the notable exception of California Lamb has moved into the same old channels of distribution and consumption f years...it had no place else to go because other areas of potential consumption have gone untapped.

It is obvious to all of you that lamb is not in over-supply. Unti lamb numbers are increased, the Council cannot go on a nationwide program. Therefore, we had to determine certain market areas where there was a potent market for lamb...and, importantly, where there was a supply available. The advertising and promotion effort started in January, 1956, on a very limited scale at first as four test-pilot cities were selected. Results showed that lamb could be merchandised and sold at a reasonable profit to all.

The number of markets was expanded to 15. They included: Philadelphia, Washington, Baltimore, Cleveland, Detroit, Chicago, Birmingham, Denver, Ft. Worth, Salt Lake City, Seattle, Portland, San Francisco-Oakland, Sacramento and Los Angeles. Later, Birmingham and Ft. Worth were dropped, a in their place were added Milwaukee and Houston. This fiscal year, beginnin July 1, four other cities are being added--New York, Toledo, Minneapolis-St. Paul and San Diego. In every case, a market is thoroughly investigated as to total food sales, the supply available and the lamb slaughter in that are If these requirements are met, preliminary plans are made to conduct the program in that area. Budget, of course, is another restricting factor.

The amount of preparation and planning that goes into a program of this type is amazing. No stone is left unturned to cover every facet of the program--from consumers to meat retailers, packers, schools, colleges, hotel restaurants and institutions. Last, but not least, the producer must be kept informed of the progress of the program since it is his money which pays for it.

The American Sheep Producers Council has this basic concept of the goals which it seeks: we are selling meat in the diet; we are trying to show the consumer that through meat and other foods, there is no need, in most cases, for substitutes or vitamins. We are also pointing out to the consume the wide variety of cuts available since we feel that this is not only good philosophy for the sale of lamb, but other red meats.

The Council has three specific aims in mind for its lamb promotion program: First, the creation of an all-carcass demand for lamb; not just the legs and chops, but all parts of the carcass. This in turn takes the heavy burden of profit off of the legs and chops and actually makes them more reaso ably priced. At the same time, those cuts which, in some cases, were very lo priced or even discarded, are now profit-building items for retailers. In one promotion city, for example, lamb shanks used to sell from 15 to 19 cents a pound. Now, they are up to 42 cents; largely as a result of our promotion and advertising. Secondly, we hope to build a year 'round demand for lamb a counteract the belief that lamb is only available in the spring of the year. In this connection we also refrain from using the term "spring lamb" because, after all, there are a dozen different interpretations of "spring lamb". For example, is it lamb ready for market in the spring? Or is it lamb born in the spring and ready for market in the fall? And thirdly, we hope to develop something resembling a nationwide demand for lamb. We realize here that we must go slowly in developing new promotion cities. We must balance our program with the supply available and not advertise ourselves out of a market.

Our program is largely one of education for the consumer. In our advertising point-of-purchase material, we stress the taste appeal of lamb for a taste adventure. We try to inform the consumer of the nutritive value of lamb, and we try to show Mrs. Homemaker and her family that lamb is a hearty meat, rich in protein and energy---just as suitable for the truck driver as the dainty librarian. We also stress the variety in lamb with the slogan---It's delicious so many different ways!

To the retailer, we try to point out how lamb is one of his best profit items. We have every bit as much educating to do with the meat retailer as with the consumer. He, like the consumer, has fallen into a rut in buying and selling lamb. He has dealt largely in only legs and chops. We show the retailer how to cut and merchandise lamb. In fact, we have prepared a complete Lamb Cutting & Merchandising Manual which has proved very popular. You see, if we encourage Mrs. Homemaker to go to her meat market and buy a certain cut of lamb--and this cut is not available--all our efforts are in vain. So, you can see the vital importance of making retailers aware of lamb and how to cut and merchandise it. I might also add that only 39% of the meat markets in the United States offer lamb for sale.

To the packer, we supply information on our program. We make certain that he is aware of what we are doing and what advertising schedules we have planned. Only in this way can we be sure that there will be an adequate supply of lamb available in any given city.

The cooperation of packers and retailers within the past year has been amazing. At first there was some understandable reluctance on the part of packers and retailers to cooperate, but now that they have seen our program in operation, we have had excellent cooperation. The same may be said of the hotel and restaurant trade which, as you know, is a very important element in food consumption these days. 25% of the meals consumed are eaten away from home, according to some surveys.

Now, here is the operational team of the American Sheep Producers Council. First, the lamb merchandising department.....a vital unit in the operation, responsible for the development of point-of-sale material, consumer recipe folders, merchandising aids and a grass roots contacting of packers, meat retailers, hotels and restaurants within a promotion area by our lamb merchandising men. These men cover two to three cities. For example, Erich Rohlwing of Chicago, covers Chicago, Milwaukee and our new market, Minneapolis-St. Paul.

Next is the consumer service department which, in effect, is our home economics department. The consumer service department is our contact with the consumer. Home economists in the various promotion cities give tal and lamb cooking demonstrations before various women's clubs and civic group they conduct classes in schools and colleges; they work with other home econ mists and dietitians of institutions; they also contact the local food edito of newspapers, radio and television stations to solicit their cooperation in the use of lamb recipes and stories. They work with 4-H clubs, Girl Scout groups and even frozen food locker firms. We have even made contact with th chefs of airlines, railroads and steamship companies to encourage their use of lamb on the menu. That gives you some idea of the extent to which we attempt to cover the field.

Next, we have our advertising department, which consists of the advertising director and his secretary. He works directly with our lamb advertising agency in the preparation of ads, selection of media and development of schedules.

Last is the education and information department which is responsible for a variety of things including all types of news releases to all types of media; preparation of information booklets for various segments of the trade; development of motion pictures, a film slide library and exhibits. Another new addition to the E & I department, and one of paramount importance is the market study division. As most of you so well know, there must be som criteria with which you can measure the success or failure of a program. Thi market study program seeks to gather together facts from many different sourc and process them into usable tools. In this way, we not only can evaluate ou past efforts, but also provide some measure of direction or guidance for the future.

Now, let me tell you of how these various departments work together in creating a promotion and advertising effort. Let's take Minneapolis and St. Paul as an example. Each promotion city is essentially the same with slight variations to adapt to local conditions.

We are going to start active advertising efforts in the Minneapolis-St. Paul area this summer, but there is considerable preparation in pre-promotion work to be done. The advertising, first of all, has been set to balance with an adequate supply in that area. We try to hit peak periods of supply with our most intensive effort to reduce the always present danger of a drastic price break. For the past two weeks our lamb merchandising man and our home economist in that city have been making their contacts. The merchandising man has checked the supply situation with packers and processors. He has made contact with major retail outlets explaining our program and urging thei cooperation in such things as use of point-of-purchase material and tie-in advertising of their own. He has alerted hotels and restaurants to the fact tha lamb will be promoted in this area and that they too can take advantage of thi added emphasis on lamb.

The home economist, at the same time, has been contacting clubs, schools and colleges; conducting cooking demonstrations and giving lectures so that many consumers will be aware of lamb when the advertising program breaks. She has visited the food editors, soliciting their assistance in using lamb recipes. An important part of the consumer service department is its product publicity. Our product publicity is handled by a company which deals exclusively in the development of recipes and the supplying of these recipes, stories and photographs on lamb dishes to newspapers and other media in our promotion areas. Although the product publicity is intensified within promotion areas, it extends far beyond that to some 168 newspapers, for example, and many syndicates. They supply color photos of lamb dishes for newspapers and magazines, many of which you may have seen recently.

When the advertising program breaks in a promotion city, the stage has already been set with this grass roots promotion program so that maximum benefit can be obtained from the advertising.

Because lamb is comparatively unknown in many areas, we use the recipe type of approach suggesting not only what to prepare, but how to prepare it. We are using color spectaculars, full-page, four-color ads, in newspapers featuring at least two main dishes to an ad. These color ads are spaced to run during an advertising period once every two or three weeks. But along with them--in between the color ads--we use one-third page back-and-white ads, again featuring lamb recipes. The color ads create an awareness of lamb, and we hope, a desire on the part of the housewife to use lamb in her menu. The black-and-white ads sustain this interest in lamb and add variety to the program as far as the consumer is concerned. In addition to the newspaper ads, we also have radio and television commercials. We may use only one media or all three medias, depending on their coverage and impact.

We don't neglect the other phases of the business either; we have ads in grocery publications showing retailers how to cut and merchandise lamb for greater profit; we have ads in hotel and restaurant publications encouraging their participation in the lamb program. Yes, and we even have ads in home economics publications offering teachers our many teaching aids for their use in school.

Now, just a word about the aids we have developed to help others promote lamb. There is the Lamb Cutting & Merchandising Manual for packers and retailers. This is the most complete lamb manual ever prepared. It is well illustrated, showing a variety of cutting methods. It also describes how to buy, merchandise and sell lamb. It is available in complete form or merely by chapters. Then, there are the full color recipe folders. We now have three. These recipe folders are excellent hand-out material for retail stores and a handy holder adapts to any type of meat counter display. We have heat seals for sealing lamb packages in the meat market and also grease-resistant inserts which can be included in the package of lamb if the store has its own self-sealing process for its meat packages. Each seal and insert has a recipe for the enclosed cut of lamb. These are available to retailers at a very nominal cost. We also have a series of reproduction illustrations and mats of both prepared dishes and raw cuts for use in newspaper tie-in advertising by the retailer. We also have glossy photographs of cooked lamb dishes for retailer tie-in advertising. To go along with our consumer recipes, we have what we call a "Cuts of Lamb" booklet for distribution by retailers and our merchandising personnel. This booklet was developed from one published by the National Live Stock & Meat Board, called "101 Meat Cuts".

Our home economists, as well as our merchandising men, have motion picture films to aid in their work. The home economists have a film entitled, "Let's Have Lamb", a 14-minute motion picture with a light plot which shows how to prepare and serve a variety of lamb dishes. In addition, they have a series of three featurettes which are 4½-minute films with no plot and are used as educational tools in the preparation and serving of lamb. These film also are widely used on television. These three featurettes were produced in cooperation with the National Live Stock & Meat Board. In fact, they sponsor two of the featurettes and the Council sponsored the third one.

The merchandising men have a film entitled, "There's Good Money In Lamb", a 15-minute color film which shows different cutting methods and how the retailer can make more money from lamb. This film has proved exceptionally popular and has been widely used by grocery store associations as well as chain store organizations.

I would like to mention here that our films were produced last fall with the very generous assistance of the National Live Stock & Meat Board. Their personnel devoted considerable time and effort in preparing dishes and cuts of lamb for use in the films. It was my pleasure to work with them, and I can very sincerely say that they are experts in their field, besides being wonderful people.

Gentlemen, this has been a brief description of the American Sheep Producers Council. In closing, let me say that we have no illusions about working miracles, but we do hold that the position of lamb and other red meats can be improved in today's highly competitive world, if we continually tell th American people of meat's many merits for safeguarding their health and happiness. Frankly, I don't believe that we can over-emphasize, in our promotion and advertising, the great nutritional aspects of meat, and the fact that, despite some adverse publicity, meat, and food in general, is without a doubt, the best buy in America today.

We are interested in helping the producer of lamb and wool find markets for his products with a reasonable return and without the traditional and disastrous price breaks. We realize that he must do his part in supplying a quality product, and except for the excellent research work done in our colleges, this would not be possible.

Remember, gentlemen, you can build a better mousetrap, and the world may beat a path to your door. Yet, a path is not enough these days, you need a super-highway to compete with all the gimmicks and gadgets that nibble away at income that should be going for food.

If at any time the American Sheep Producers Council can be of service to you, we hope you'll call on us.

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MR. KELLY: Thank you, Dick, for that very informative discussion.

I believe that some of this material that you have available might be of interest to various members of the Reciprocal Meat Conference and perhaps we could give them an address to which to write.

MR. BIGLIN: The American Sheep Producers Council, 520 Railway Exchange.

MR. KELLY: Dick Biglin, 520 Railway Exchange Building, Denver 2, Colorado, in case you are interested in some of the material that Dick was talking about. I have been fortunate enough to secure a copy of the lamb merchandising booklet or manual that they have and I believe that it is well worth the $3.50 that they charge for it.

You have heard what is being done on the national level. We thought it would be well to present a program that is carried out on the state level, and the next speaker I am sure needs very little, if any, introduction to this group. Professor James D. Kemp will speak on the lamb promotion project that has been carried on in Kentucky. (Applause)

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THE KENTUCKY LAMB PROMOTION PROGRAM

JAMES D. KEMP
UNIVERSITY OF KENTUCKY

Lamb production in Kentucky is usually profitable for farmers and has been for many years if they take the time and put forth the effort to do a good job. Normally there are about 650,000 lambs produced in the state annually and this appears to be on the increase again. We think that we produce some of the best lambs in the country yet our people normally eat less than one pound per capita per year. We know we have a good product; we know it is very palatable if properly prepared; and we know that some of the cuts are economical; yet we eat little of our own product. In view of these facts a lamb promotion program was prepared and carried out in 1957. Our objective were this: To get more Kentuckians to eat more lamb so that it would:

(a) Influence them to include lamb as a regular item in the diet.

(b) Stimulate retailers to handle more lamb and merchandise it profitably.

(c) Stimulate the packers to sell more of the product from the state within the state and thus help their business.

(d) Stimulate the producer to produce more and better lambs.

(e) Increase the profits in all segments of the industry - producer, packer, retailer - by making this a Kentucky enterprise.

In view of these objectives a committee was appointed under the auspices of the Bluegrass State Sheep Association to spearhead the promotion program.

In setting up this program we endeavored to include on the committee representatives from as many organizations as possible that were interested i any way in the lamb business. The members of the committee represented:

a. Producers
b. Stockyards
c. Packers
d. Retailers
e. Hotels and Restaurants
f. State Department of Agriculture
g. Farm Bureau
h. Educational institutions
i. Extension service
j. Service clubs
k. Banks
l. Hospitals
m. Public Utilities
n. State Agricultural and Industrial Development Board

The committee was a lamb promotion committee but we wanted a name that would attract attention so we became known as the K.L.F.F.K. (Kentucky Lambs First for Kentuckians) Committee.

We had no budget so we had to think of ways to promote the program thout paid advertising. A representative of the stockyards group was lected secretary and he was able to utilize their secretarial force to type, imeograph and send out notices. Some of the other committees also used ecretarial help of their own but to a lesser degree. As with any group of olunteers, some carried out their assignments in an excellent manner while thers lagged in their efforts.

In order to do an effective job it was agreed that July should be fficially known as lamb month as lamb was usually plentiful in July. With ne week following July 4 being designated specifically as lamb week. We were ble to get the Governor to proclaim these as such. Pictures were taken of s signing this Proclamation and they were distributed to the state newsapers. The University President was very cooperative and signed a similar roclamation which was given local front page newspaper publicity.

Since we had no paid advertising, the newspapers, radio and teleision stations were very cooperative and gave full coverage of our committee eetings and the work of all concerned. We think that their news coverage as worth more than general paid advertisements so the advertisement was left p to the retailers.

As many people didn't know how to prepare and serve lamb we decided hat something should be done to aid in these areas. The National Live Stock nd Meat Board made some of their personnel available. Monty Flett came to entucky and put on lamb cutting demonstrations before retailer groups. Some f the ladies of the Board helped with some cooking demonstrations and appeared n radio and television programs. Recipe booklets were distributed to intersted persons. They supplied the movie "Its Lamb Time" that was shown to ifferent groups. The American Sheep Producers Council also cooperated. ugene Blish of the Council was in Kentucky during much of this time and worked ith different producer and retailer groups. One of their ladies spent several ays in the state and aided with some cooking demonstrations and appeared on adio and television. They furnished "point of sale" kits of advertising aterials to the retailers to display in order to attract attention to lamb nd to advise as to methods of preparing and serving. They also furnished umper stickers with this slogan, "Lamb's My Meat". The newspaper food editors an many recipes in their columns during this time - recipes furnished by the eat Board, Sheep Producers Council, the University of Kentucky and others. everal homemaker television shows featured lamb and lamb recipes especially hose dealing with the less demanded cuts.

All high school and vocational agriculture teachers were contacted hrough the Agricultural Education Department of the University and the State epartment of Agriculture. They were urged to emphasize the importance of amb to their students. The State Department of Agriculture worked with the ress in preparing material for release at the proper time. The presidents of he different colleges in the state were contacted and asked to urge their od service personnel to serve lamb during July. Hotels and restaurants were sted to feature lamb. They were supplied with "tents" for their table sugesting lamb. Hospitals were asked to include lamb in their menus. Service lubs were asked to serve lamb once or more during July. Most of these organitions willingly agreed. One of the major utilities companies included a section on lamb in its booklet it sends with electric bills. One of the television stations, the largest in the state, gave its entire hourly Saturday farm show to the lamb committee. This reached a lot of people and received a lot of comment.

With all the advance publicity the retailers were willing and almost eager to sell lamb in July. Many stores that had never handled lamb bought some. They featured lamb in their newspaper advertising and were prepared for the customers. Unfortunately for the customers, lamb prices were abnormal last year. Usually the Spring lamb market has broken by July. However, last year the lamb market was unusually strong in July resulting in fairly high prices at the retail level. In spite of this, however, the promotion was successful.

Just how successful was the promotion! We know that many stores handled lamb that didn't normally handle lamb. We know that most of the stores not only were able to sell the so-called preferred cuts but thanks to good promotion of recipes by newspaper, radio, and television the more economical cuts moved satisfactorily. But the proof is in the dollar volume or pound of lamb handled in comparison with other years. Based on packer sales this was as follows compared to 1956.

	Percent Increase in Dollar Volume		
	July	August	September
State as a whole	54	28	22
Lexington-Louisville area	54		
Hotels and Restaurants	59		
Bowling Green area	61		

It is clearly shown that the biggest increase occurred while the promotion was in full swing. There was some carry-over into August and September but the results show that for continuous effect the promotion must not stop. The big increase in the Bowling Green area was due principally to one man - the operator of a local chain of groceries. The week following the official "Lamb Week" he designated as his own "Lamb Week" in that area and really advertised and promoted lamb with very gratifying results.

We are now in the midst of a similar program as this week is Kentucky Spring Lamb Festival Week. With a year's experience we know a little more of how to proceed. We tried to eliminate "dead wood" from the committee and add fresh personnel who, we hoped, would work. We know that lamb can be sold. We know that most people who bought it liked it. It seems that the problems are to get people accustomed to it so that it will be a regular item in the diet rather than a specialty item and to get retailers to handle it regularly.

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MR. KELLY: Glenn Kean, who is no stranger to this group and I think holds the distinction for probably waking up more people more of the time at the Reciprocal Meat Conferences will lead the discussion.

MR. G. R. KEAN: Gene King and Bill Cole here reminded me this morning of the two brothers, the only story that I know. They lived in a small town and they were really ambitious and rather intelligent. All through grade school, high school and college they kept working to outdo each other. As the result of their tremendous zeal, as happens with a lot of brothers, they didn't speak. Both were destined to make something of their lives in the world. One went to West Point and graduated and the other went to a school for priests and became a priest and he worked himself up in the Catholic church. At the end of about 25 years the West Pointer was a four-star general and the other one was a cardinal.

They had not seen each other and they had not written to each other but each in his own way was convinced that he had done the best in the family. Finally they met in the Grand Central Station. The cardinal happen to spy the general and he walked up behind him, tapped him on the shoulders and said, "Say, porter, can you tell me, is the train at five o'clock to Chicago going to run on time?"

The general turned around quickly and recognized the cardinal as his brother and without hesitation he said, "Yes, madam, but in your condition do you think you ought to travel." (Laughter)

Somebody suggested that I might be in that condition. (Laughter)

I think that we have had two very interesting and stimulating talks, and it was certainly educational from Mr. Biglin's standpoint as to just what the American Sheep Producers Council is doing to help to promote a product which we are all so very much interested in. I don't have anything in particular to add. I should just like to start the discussion in this way: A few of the packers in our state have this to say about lamb. They say they like it. One mentioned that in 29 years of killing, on a yearly basis they never lost money on the lamb side of the packinghouse business, but they said, "We are not happy with it because we never can deal with the same man twice. We start in Kentucky in the spring and end up out some place in Idaho in the fall and every week we are dealing with a different man. We don't like it because it does not give us a chance to get back at him. He sticks us one week and the next week he does not have anything to sell."

If we promote this lamb what can be done on that side to get enough lamb on a year-around basis of the quality that they want? Can either of you two gentlemen answer that question?

MR. BIGLIN: I wish I could. That is one of the reasons we have to tread very carefully and very slowly in our work, to see that we don't over-advertise or over-promote in a certain area where lamb supply suddenly runs out and the packers can't obtain any. That is one of the problems of distribution that we have to contend with, and we hope that as production increases we can improve the situation in that respect. It is a slow process, as I said, and you cannot hurry nature too much. So that we have to balance that out and to be sure that in our promotion cities at least we try to balance the advertising promotion with the supply; otherwise we are cutting our own throats and I know that in many areas of the country that is a problem.

MR. KEAN: I think that is one of the important problems on the production side. Somebody in our area suggested that it we could get the to breed two or three times a year or certain strains or species of them to produce multiple litters like hogs do we might be able to satisfy the demand.

Are there questions from the floor?

MR. SNYDER: I have one. Mr. Biglin, I want to compliment you on that manual that you put out, and I think it would be rather interesting to see the hands of the fellows who have that manual. Well, let's reverse it. How many don't have it? Well, it comes to my mind, Mr. Biglin, that you are looking at a group of college men who are not overpaid as a general rule. The fact of it is their expense account is not of such a nature that they can buy the books that they would like to have. You opened the door to this thought when you closed your talk by saying that if you could help us you would be glad to do so in any way we saw fit.

I don't believe that you could spend any money better than to see that every one of the men here who is interested in promoting lamb gets one of the lamb manuals. It is a good one, fellows. I think that every man ought to have one at least as a reference manual, and if we need two in our teaching work, I think he ought to give us two. (Applause)

MR. KEAN: We always like something free.

I think that we have time for just one quick question because we are running short of time. Are there any other questions?

I just want to end the comments by saying that they had a very ambitious program and it looks to me like they went to no end to get that done.

MR. KELLY: Dick says that if those of you who are interested in obtaining these manuals will give him your names or will write to him he will take care of it for you.

MR. SNYDER: Thank you, Dick.

MR. BIGLIN: No refunds, though. (Laughter)

MR. KELLY: As you wll know, the grades of lambs were changed early in 1957. This committee felt that a discussion of these grade changes was in order for this year's conference. The grade changes were well defined by the grading service representatives at last year's conference. However, to refresh some of your memories and to bring those of you who may not be too familiar with the lamb grade specifications up to date, I have asked Ned Tyler if he would take a few minutes to outline the major changes, so that you will have a better background for the following discussion. Ned. (Applause)

MR. TYLER: Thank you, Bob and Members of the Conference.

As Bob said, I will refer you to last year's proceedings for a detailed discussion of these changes. I should like just briefly today to bring to mind the major changes that took place last year in February when we changed the standards. There were about four major changes, the first being that the quality requirements for the more mature lambs, Prime and Choice, were relaxed. Only the more mature lambs. The quality requirements for the Good grade were tightened primarily for the very young lambs.

This is the third major change. Practically all references to quantity of external, kidney and pelvic fat were deleted from the standards.

The fourth change was that conformation was allowed to compensate for quality in the Choice grade. By that I mean a lamb of good quality that had average choice conformation was allowed to grade Choice.

Then last, changes in yearling mutton and mutton were made to coordinate them with the changes in lamb.

I will ask the other members of the division if there were any other major changes that I have failed to mention. I think they are the major ones.

First of all let me say that these changes were recommended by an industry committee that was appointed by the National Wool Growers' Association. It took place in February. Then when Jim's spring lamb started to come we heard a little cry, "I thought you relaxed these standards, but we are not getting any higher grades on these younger lambs." Well, they were not changed in the young category.

I believe that is all, Bob.

MR. KELLY: Thank you, Ned.

The committee felt that you would be interested in knowing if the change in the lamb grades had an effect on carcass acceptance and lamb production. Carroll Schoonover, of the University of Wyoming, will present the effect of grade changes on the production of lamb.

MR. C. SCHOONOVER: When Bob wrote me about this topic I felt it ought to be a rather easy paper to give, that all I would have to do would be to contact some producers and find out their viewpoints and present them to this conference. I did that. We had a sheep and wool school at the University of Wyoming which gave me an excellent opportunity to talk to some of the producers. Most of them were unaware that grading changes had taken place.

When I looked at last year's conference proceedings and the remarks that were made after Mr. Murphy's address, I could understand why good many of us were unaware that grade changes had been made. Howeve our producers were not without opinions and I will relate some of them to you.

We have to remember that in lamb, as in other meat products, grading is related to price, but still at the same time packers do buy dressing percentage and weight as they are buying grade; so that both of these things are important to the producer, dressing percentage and weight along with the grades. The grades, of course, make no mention of these two factors.

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EFFECT OF RECENT CHANGES IN LAMB CARCASS GRADING ON CARCASS ACCEPTANCE AND LAMB PRODUCTION FROM THE PRODUCER'S VIEWPOINT

C. O. SCHOONOVER

UNIVERSITY OF WYOMING

In considering the producers viewpoint, it must be pointed out that apparently most western producers are unaware that changes have been made in lamb grades, and under these circumstances it is difficult to represent fully the producers viewpoint. The change in lamb carcass grades, effective February 11, 1957, has been in effect sixteen months at this writing and any appraisal of the grade changes from the producers viewpoint may be presumptious at this time. Discussion in this paper however, will be limited to the western lamb producer and will not reflect on conditions prevalent in other sections of the United States.

Even though a direct relationship exists between grade and price it must be remembered that packers still buy dressing percentage and weight while buying grade. These factors although not considered in the standards are important in the sale of lambs and affect both producer and feeder.

Murphy (1957) reported in general on the changes in the standards. In brief the changes lowered minimum requirements for older lambs in the prime and choice grades and tightened the requirements for young lambs in the good grade. In addition, desirable conformation is allowed to compensate for deficiencies in quality, i.e., a lamb with conformation equivalent to at least the mid-point of the choice grade may have evidences of quality equivalent to the upper third of the good grade and remain eligible for the choice grade.

Lamb comsumption has dropped steadily since 1955 and present indications are that per capita consumption will be less in 1958 than in 1957. At the same time lamb prices have remained static this last year as compared with the price increase of other red meats. These two factors have not indicated that recent changes in grading are beneficial to the producer. However, it would be pretentious indeed to assume that the grade changes alone are responsible for decreased consumption and low prices.

Producer lambs from the western states fall into two categories, those sold as feeders and those from certain areas where summer range is favorable for the production of a high percentage of fat lambs, which are marketed direct to the packer. Fat lambs directly marketed by producers may be affected by tightening of the low limits of the good grade. Many of these lambs are sold in the good grade and this change may reduce the number eligible for this grade. On the other hand, many of the fat lambs marketed by producers are black face crosses and have good mutton conformation. Accordingly, it is very possible that many former high good lambs might now be eligible for the choice grade on the basis of conformation.

Lambs sold as feeders are subject to weight requirements of the feeder as dictated to him by the packer, retailer and possibly the consumer. Any change in grade standards must operate within these weight limits. As the grade changes affect the older or fed lambs in the prime and choice grades it is difficult to see any immediate benefits from this change in favor of the producer. In substance it appears that this change would give the feeder more diversity in his feeding regime by being able to market his older and slower maturing lambs at higher grades.

In general, the grade changes appear rather minor in nature, and possibly for this reason it is difficult to discern now or expect in the future any change in carcass acceptance which might affect the primary producer.

The western lamb producer is very price conscious and any change in carcass grading must result in a noticeable price increase at his level to be beneficial to him. It is interesting however, that some operators are suggesting a complete revision of the grades. New grades to be patterned after U. S. hog grades with more emphasis placed on lean than on finish, which in turn would promote breeding towards a meatier and earlier maturing type of lamb.

In conclusion, several points should be considered: First, the exchange of western lambs is affected more by weight limits and dressing percentage than it is by grading. Second, any economic shift due to the grade changes may not yet be apparaent at the producers level. Third, the changes that have been made appear rather minor in nature. In order for grade changes to affect the producer, they must be comprehensive enough to change the buying habits at the packing house level and in turn the buying habits of the feeder.

Literature Cited

Murphy, C. E. 1957. Some recent changes in lamb carcass standards. Proc. Reciprocal Meats Conference.

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MR. KELLY: Thank you, Carroll.

To present the feeders' viewpoint on the effect of grade changes we have been very fortunate to obtain the services of Mr. George R. Johnson, chairman of the Department of Animal Husbandry at Ohio State University. (Applause)

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EFFECTS OF RECENT CHANGES IN LAMB CARCASS GRADING ON CARCASS ACCEPTANCE AND LAMB PRODUCTION FROM THE LAMB FEEDER'S VIEWPOINT

G. R. JOHNSON

OHIO STATE UNIVERSITY

First I should like to say that this is my first opportunity to tend the conference. I have been very pleased with it so far, for two or hree things that I think are important. One is that this is one of the few onferences that I have been to where the timing has been made so it can be rkable. We don't have to jump from one paper to another.

I suspect that I must have dropped out of the meats work as a meats xtension worker when George Wellington took over in New York, just about the ear that this conference started, so I didn't have a chance to come to any f them.

There is one other thing that I should like to mention that your hairman mentioned; that is the work of this committee and the chairman. It s one of the few times that I have been asked to make remarks that I have ad such excellent cooperation and suggestions as to topics you might be in- erested in. It was a fine answer from the committee chairman, one of the ew that I have received when I have asked what groups would be interested in earing. I really got the story.

I should like to use the three major questions that he posed for his discussion. One was: What effect has the change in grading specifica- ions had upon the feeding of lambs? Are producers receiving more dollars per undredweight for graded weight? In other words, more than they used to. Are he heavy finished lambs still bringing by far the top dollar?

The second question that he posed was: How do country grades now ompare with fed carcass grades?

The third question was: How will the present carcass grade stand- rds for lamb affect the lamb feeder in the long run? Will they help the in- ustry as you see it?

Now with regard to the first question and to learn a little more bout the entire situation I did contact several of the college folks in other tates, such as Murray Trump, in Colorado, the extension man, Professor Alexan- er of Nebraska, and Bob Jordan, of Minnesota, and Henry Mayo. Those are some f the ones that I did hear from. I happened to have a chance to talk with ewey Johns about the Iowa situation when he was in Ohio recently. I think t of you know that Dewey works for the state department.

Most of my remarks will have to be strictly opinions, and I will try give you the thinking of these other men as well as some of my own ideas.

I did not contact any of you folks who are here, that is, the meats men, per haps the ones who may know the most about it, because I knew that you would be here and would be ready to jump into the discussion period at the end of this little talk.

So that now I should like to go back to this first item with regar to price, and to start the discussion I should like to take you back to Febr ary when I walked into an auction market in Ohio, and they had just complete the grading of lambs. Perhaps we should say they had sorted the lambs becau they were not attempting to make Federal grades; they were attempting to sor lambs in pens for sale. Most of you know how they sort many times, such as on this particular occasion, the top two and possibly just a few in the thir pen they expected to grade above Choice if they became Federally graded but most of them are not Federally graded.

Well, what I should like to comment on is that the No. 1 pen and the No. 2 pen sold for only 25 cents per hundredweight difference, and I am sure that this is different than it used to be. Maybe not last year, althoug there was some of this same thing last year, but a few years ago there could have been as much as $2 difference in those two pens. There are a lot of factors that could enter into that, that I am not going to discuss, whether it was entirely the kind of lamb, or whether it is the fact that we are down to too few numbers of buyers and they are going after each other pretty hard for some of these lambs. However, it is true that in most of the seasons thi year we did have a narrowing of the margin on the top pens of lambs.

Now some of the comments afterwards. There happened to be one man who didn't bring any Federal lambs but he had been in the habit of bringing in native lambs or lambs produced in Ohio. He looked the situation over and he said, "Why go about producing these highly finished lambs, such as are in this pen, when today they bring 25 cents difference?"

In talking with one or two feeders that day their comments were tha they could bring in some lambs that would probably sell quite well, maybe not with the amount of finish that they ordinarily had been putting on them but they could not afford to do it because their money was being made not due to the margin but primarily due to the feeding ratio or the efficiency and putti it on in the gain.

The other thing that happened that day, just in passing, was that the feeder lambs were about the same price as the top two pens. Prime lambs are still bringing the top dollar but it is due more to dressing percentage I think than it had been.

I am not going to say too much more. Mr. Schoonover has already mentioned the importance of dressing percentage, and when you are talking to lamb producers, buyers, and commission men very seldom do they mention lamb grades. It is pretty much dressing percentage.

To point this out I did pick up some quotations on old crop lambs, realizing that we are getting pretty far along on old crops but we still do have a few coming out of the lots, and I talked to one of the major handlers of lambs in Ohio and he gave me his base figures for operating to the end of last week. He had $18 on Choice and Prime with a dress of 47; $16 on Good with a dress of 45. This is eastern kill. Twelve dollars on Commercial with a dress of 43.

Well, right away I see some eyebrows raise and they are saying, "What is the matter with this fellow? Doesn't he know there is no such thing as Commercial lamb?" Well, they also have a Utility grade that they deal with as far as their base is concerned, but my own interpretation of this is that this particular handler has stayed with this Commercial because he feels the need of a grade in between the Good and the Utility on some of these fed lambs. The only thing you will notice is that he put his Choice and his Prime together in his quotations and dressing percentages. I just throw that out for any comments that anyone wants to make.

You will notice that he had a 2 cent spread for a dressing per cent this last week, which means that the carcass price for the Good, Choice and Prime, all three, had to be rather narrow, which we realize is true at the present time.

Now as to the feeders that I have talked to about moving lambs. I found only one who had been moving lambs a little less finished than he had in previous years. He happens to be a man who is tied in with a local packer who is an Ohio packer and moves his lambs for immediate kill the next morning, and the dressing per cent has been holding up very well on those lambs, and he has been moving them at slightly lower weights and not quite as much finish as in the past.

Most of them, of course, have to depend on the profit, as I mentioned from the pounds of gain but, as Schoonover said, let's have the heaviest lambs we can get on the market. Some of these heavy lambs that are coming out of the West perhaps are being held back a little on the finish because they are coming in with not too high a finish and we have to sell them at the weights we used to; so that when you start out with a lamb quite a bit heavier you do not have the chance to put on the fat long with your weight at that time.

Another thing I should mention is that lamb feeders seldom know how their lambs grade in the carcass. Very little information is carried back to the feeder. One reason is that the lambs are not killed near the feed lots or where they are produced. Our lambs are mainly killed in the East. They do not have much information on their grades whereas a beef man will many times.

I asked about the percentage of lamb that is graded Federally. About 30 per cent now. Very few Ohio lambs, either the natives or those out of feed lots, are Federally graded, because most of the packers who buy them are quite resistant to it and they do not grade them unless they have to.

Another thing right along with that is the kosher trade. I do not need to say anything about that. There is very little Federal grading with that.

The other thing that is important that is quite standard in Ohio with lamb pools and others is that we actually have three sorts that we expect are going to dress Choice or better, and that is pretty much on dressing percentage. In other words, the top three sorts are pretty much on dressing percentage. The information that I received from Colorado, from Murray Trump pretty much expressed the same feeling. He said that he did not feel there had been too much change and that they had not realized these grades had changed too much in Ohio.

One of the men that I talked to said that he thought that theoretically the live grades should come along and help us out, but Frank Lee did no think that our live grades agreed with our Federal carcass grades too well. Now this disagreement between the live and the carcass grades does not seem to be too big a problem, if the buyer understands and knows the sorts that ar being made by the man in the country.

I don't think I need to say anything more. I am trying to hurry along a little to catch up on your time a little.

Now the third question that was posed was: Where will the present carcass grade standards for lambs take the feeders in the long run? This kind of reminds me of a paper that I wrote about ten years ago when I was up at Michigan State, for one of those economics courses, on the short erm and the long term prospects of various things. I suppose the most important thing at the time was that I got a pretty good mark on it. I have carried my notes with me for quite some time and in changing offices a while ago I ran across this paper in the bottom drawer of the file. I don't look at them very often but I do carry them from one place to another. This paper happened to fall out of the drawer and so I read it. Well, I could see that my predictions were probably about as far off as to what was going to happen on a few things as they could be because I am now living in the time that I was predicting at that time and what I predicted just is not happening. I suspect that anything that I might say as to what is going to happen here will be very similar and I have already given you my qualifications for doing it.

Only one man that I talked to felt that the change in grade standards as we know them now would have much effect in the future as far as the feeding proposition is concerned. One man did feel that it would have an effect, but this was in a letter and he did not tell me why. I cannot help you out on his reasoning because it was not in his letter. Most of the others felt that it was a case of status quo as far as what the grades would do to the feeding because the feeding business is still dependent on margins which. of course, have been small, the feeds available and various other factors, rather than just changing the grades. Actually these heavier lambs and wool margins have hindered the feeding business.

Now if conformation, as has been suggested, would help to increase the grade, to get a meatier lamb, that would be quite important, especially for our native lambs and also perhaps our Western. But in our case we still prefer the Western over our native, although we have had buyers or feeders this past year buying more natives. Well, if we could get some of these very desirable conformation native lambs that have not graded as well in the feed lot -- get the grade up and get them to sell enough higher to make up for the less efficient gains perhaps it would make a change in our feeding business. We would have a desire to feed more of the natives.

The demand for some of the Federally graded lambs by the supermarkets I am sure will help to reduce this resistance to Federal lamb grading by the packer. We have all seen the low Choice lamb, of course, out sell Prime lambs. George Wellington and I were talking about it last night. We were in New York City following up some school lambs. We had our top lamps which we considered Prime lambs at that time and in the next pen were Choice. We actually saw in the packing plant -- it happened to be a kosher plant -- our No. 2 grade lambs outselling -- and this was not yesterday, this was quite a few years ago -- we actually saw our No. 2 lambs outselling the No. 1 in the carcass. The only reason the packer was able and willing to pay more for the top grade lamb was strictly due to the dressing per cent.

So I am sure with the demand for lamb with a little less finish, especially from the large volume buyers such as the supermarkets, there may be some change and this resistance may be lowered.

Now the comment I made about prices was not always true of our lambs, but quite often it was true. It would be nice if we could use more roughages perhaps and not put on such a high degree of finish, but I do think that we need to put more emphasis on the factors of conformation and quality and just consider dressing percentage for what it is. We are going to have to work constantly to meet the needs of the breeder, the packer, and the consumer with our grades if we are going to change them. We do need a meatier lamb.

Again, the same old problem. I could not be representing the lamb feeder if I did not bring up the case of heavy lambs and what we can do with them. In other words, they are growing them bigger and we want them to grow them still bigger when we get into the corn-belt. So what can we do with them? I have saved this until last. I think that I probably should have started with it and sat down.

The first question of one of our large handlers of lambs, when I contacted him and started to talk with him about it, "What change in grades?" I showed him the changes. He is not handling truckloads today, he is handling carloads today and he did not know that there was a change until we told him last week. I am sure that with communication in this great country if it had had any effect he would have known about it. Evidently, it didn't have much of an effect and nobody had informed him about it.

Just a quick conclusion. I happened to be down at the Blue Grass meeting when they started their session on More Lamb for Kentuckians, and I am going to repeat the story, Jim, of your good commissioner of agriculture down there. We have the same problem in Ohio. Like Kentucky, we do not eat too much lamb. We are not up to the average of the country. Their commissioner of agriculture, when he was talking and everybody was starting to get into the program, said, "You fellows remind me of the food salesman." I suspect some of you have heard the story, but it is a very good one as far as the lamb situation is concerned. The commissioner said there was a dog food company that was lacking a little in sales and so they looked around the country and got the best doggoned sales manager they could get.

They brought him in and the first thing he did was look over the situation to see where the sales outfits were and he got busy on it and held a conference in one of the hotels. He really fixed things up. He brought all the district men and everyone in and then he proceeded to give them a pep talk just like a football coach. He had all the visual aids up there and he told them the whole story.

When he got through with the story he asked, "What dog food compan has the best salesmen?" He had aroused their enthusiasm and they said, "We are!" Then he asked what company has the best group of executives. Well, they had already admitted that they were pretty good and they figured they ha better let the executives in and they said, "You fellows are!" They were really just raising up like at a revival meeting. Then he said, "What company has the best dog food?" All the salesmen and everybody said, "We have! Finally this new sales manager said, "Then why in the devil don't you sell more dog food?"

Well, there was quite a pause and then one of the oldtime salesmen got up and said, "I have not met you yet but I have been with the company quite a few years. You are new as a sales manager. I don't know whether this has anything to do with it, but the darned dogs just won't eat it." (Laughter and applause)

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MR. KELLY: We are already behind time. I wonder if there are a few questions that you would like to ask, and to lead the discussion we have Jim Carpenter from the University of Florida.

MR. J. W. CARPENTER: Thank you, Mr. Chairman.

I have been accused of being rather windy, especially by my Florida colleagues; so I will try to hold it down. I want to get on with the discussion.

There is one question that Mr. Schoonover left himself wide open on. A few years ago we had to switch over and to go toward a meat type hog. We are starting toward a meat type steer. What, if any work, are these producers doing to get a lamb that will have more muscling and especially a larger loin eye area, producing a more desirable chop?

MR. SCHOONOVER: I think this is largely a matter probably of reducing the amount of fat and it would be desirable, of course, at the same time to increase the amount of lean. Some of our producers are following some of the consumers' research that has been done and are aware that the housewife is a little discriminating against fat. I think that is their thinking behind that. They feel that to produce lamb and to market it they are going to have to improve the product at the retail level.

MR. CARPENTER: Possibly they might breed into it without actually knowing what they are working on.

All right, then we will throw it open to the floor. I am sure that there are some questions.

MR. L. D. WYTHE, JR. (Texas A. and M. College): You know that in Texas everything grows big and we are having the same problem in Texas as in Ohio and other places in that the housewives discriminate against carcasses that weigh over 50 pounds. I wonder if Mr. Biglin can tell us if the American Sheep Producers Council is doing anything to educate the consumers to eat the carcasses that weigh over 50 pounds.

MR. BIGLIN: Yes, we are. We are emphasizing the heavy carcasses, saying that we don't want to waste meat and there is nothing wrong with the bigger carcasses. We actually have a portion of our manual dedicated to heavy lambs. That is important, too, because we get a lot of them.

MR. CARPENTER: Anyone else? That is rather short then. We are running overtime. I think the talks have pretty well covered lamb promotion all the way down to the producers' and feeders' standpoint. I don't think anything has really been said as to whether the grades have actually decreased the desirability or the acceptance of lamb or whether they have increased it, since both of the men have indicated that most of the people who deal in the greatest amount of lamb don't even know that there has been a lamb grade change.

MR. KELLY: That concludes the part of the program assigned to the Lamb, Veal and Calf Carcass Evaluation Committee.

I should like to take this opportunity to thank all the committee members -- Dick Biglin, Mr. Johnson, Carroll Schoonover -- anyone who has appeared on the program -- and the Executive Committee for the suggestions that were made in its preparation.

Thank you. (Applause)

(A picture was taken following the recess.)

CHAIRMAN CAHILL: May we take our seats again, please, and we will proceed with the program.

I think our first committee report this morning indicated to us that perhaps it is quite necessary that we go on and delve into the subject matter of this second committee. I suppose there are few livestock producers who currently feel that there is little need to be concerned about what the consumer thinks of his product. I make that statement based on current prices, of course. I think there are a number of folks, however, who are forward looking and realize that now may be the time to lay a foundation on which to build as this financial picture changes as well as the supply and demand for their products. So I think it behooves us to turn to Bob Merkel and his committee and share some of the interesting comments that we have heard by way of the grapevine concerning the consumer studies and meat quality.

Bob.

MR. MERKEL: Thank you, Vern.

Due to the fact that we are a little behind time I think that we will move right into the program without too many remarks from me.

As you can see by the program here, we are going to have essentially a rehash of the conference that was held at Missouri last fall. I think that we are very fortunate in having three individuals o this program who were in attendance at the conference in Missouri.

Due to our good friend and very persuasive friend, Don Naumann we have Mr. Jim Rhodes, of the Economics Department of the University of Missouri, to lead off with a discussion on "The Economist's Viewpoint." Jim.

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THE MISSOURI CONFERENCE ON CONSUMER STUDIES AND MEAT QUALITY: THE ECONOMIST'S VIEWPOINT

V. JAMES RHODES

UNIVERSITY OF MISSOURI

I appreciate very much the privilege of speaking to you today. I have read with interest the Proceedings of almost all of these Conferences, but this is the first time I have been able to attend.

It is impossible to summarize the two-day Missouri Conference in 40 minutes, but Lyman and I will give it a try. The Conference mainly concerned beef and I shall be speaking about beef except when I specify otherwise.

Studies of consumer preferences for beef have been conducted actively for the past 5 years. Therefore, it is perfectly fair to ask what has been accomplished. What ideas have been changed? What relationships have been discovered?

I. Accomplishments.

First, preference research has emphasized the primary importance of leanness and tenderness. Again and again the various studies have emphasized the importance of those two variables. This does not mean that dryness or flavor or appearance are never limiting factors but rather that leanness and tenderness are much more often the limiting factors. This evidence has probably confirmed ideas already held by many of you, so it doesn't represent any major change in our thinking. It does provide evidence of the particular problems to be faced in improving the consumer acceptability of our product.

Second, preference research has shown much more precisely than ever before the relationships of consumer acceptance and grade and shear. Because those relationships were so much poorer than expected, the relationships of acceptance to many other variables are being explored. These new studies include age of animal, breeding, new techniques of aging, etc.

Third, preference research has revealed many details about consumer behavior which are relevant to our attempts to guarantee satisfaction with our products.

For example, the Midwestern and Western surveys have generally shown that most consumers know practically nothing about grade names, nor about any visual characteristics of beef which might be related to eating quality. If and when we researchers learn how to identify meat quality, we must develop a system for guaranteeing quality to the consumer which recognizes her lack of knowledge. We have learned how little many consumers know about cuts and particular cooking methods, so this has motivated research in a civilian adaptation of 6-Way Beef.

Fourth, preference research has begun to popularize a new concept of product design. The livestock industry understands the idea of product design. For decades, cattle have been bred so as to have better feed conversion, more uniform markings, no horns, etc. Preference researchers have pointed out that the goal of tenderness needs to be added to these production goals. Probably other goals need to be added also to produce more acceptable meat quality.

We are learning the lesson of product design after some other parts of agriculture have already mastered it. Pioneers were citrus fruits, vegetables and broilers. Merchandisers are forgetting the old days when they took whatever was produced and sold it as best they could. Today's retailers demand uniform, high-quality products in uniform supply. The U. S. D. A. has recently proposed an egg quality program that prescribes practices from the retailer to the producer. Instead of just doing a better job of sorting out inferior eggs, the aim is to eliminate practices which lead to inferior eggs.

Fifth, preference researchers have learned much about research methods. The beginning researcher today can readily learn from the literature the location of many land-mines and pit-falls and hilltop views that earlier workers have had the privilege of discovering.

For example, 5 years ago the study of preferences for meat meant either visual appraisal by consumers or eating appraisal by a few experts. Some of our most fruitful work has been in neither of those areas but rather in eating appraisals by consumers. Lest you feel too smug at our ignorance in stepping on land-mines, let me suggest that researchers lost a couple years doing research based on the false premise that eating quality is homogeneous within a grade. Brethren, you didn't give us much warning on that one.

At the risk of being quoted out of context, I think it only fair to list some things that preference research has not accomplished.

II. Non-Accomplishments.

First, preference researchers have shown the need for an improved grading system but they have not come up with that system. Some people say that we ought not to criticize what we haven't improved. That appears to be nice social behavior but poor science. Now that the need is apparent, I am confident that meat technologists will substantially improve grading. Probably some of you in this room will do that important job.

Second, preference researchers have shown much less about variations in preferences than in products. I want to explain this because it has been a source of much confusion. Our early visual studies showed that, say, 20 percent preferred Choice and 30 percent Good. These percentages were presumed to show variations in preferences. Contrast these visual results with eating results which show that 2/3 of the Good grade lins were as acceptable as the Choice grade loins. In eating studies, we have found that we cannot assume a grade to be homogeneous, as we did in visual studies. To some extent we can separate variations in eating preferences from product variation but we cannot very well relate these preference variations to a grade for the simple reason that a grade is not homogeneous.

Mr. Engelman disagreed with me on this point. He spoke at the Conference about the confusion caused by the "old cliche: 'Grade standard should be based on consumer preferecnes.'" He further argued that a principal reason why this "old cliche" was wrong was that most consumers have different preferences. Our results at Missouri suggest that preferences for beef of a given eating quality are not very different. Our position is that the shaping of grades can be and should be greatly influenced by consumer preferences -- regardless of whether they are identical or different. Missouri Bulletin 612 discusses the logic of beef grades in some detail.

Third, preference researchers have not learned how to assure beef quality every time. The meats researcher who discovers that will not only solve a problem of utmost importance but may also change the function of grades from a classification of quality to a classification of yield.

Fourth, preference researchers have not solved many merchandising problems such as the optimum degree of trimming of external fat. Some of these problems have not been tackled for lack of tools or because they seemed to be much more of private than public concern.

There are of course many other problems of interest to meat technologists and/or economists which have not been tackled by preference researchers because they are outside the limited area in which preference research can be fruitful.

III. Difficulties in Preference Research.

I have already indicated some of the difficulties of preference research. Since the Missouri Conference spent a great deal of time on these problems, they are worthy of a brief summary.

The first difficulty is a lack of fundamental theory. Any well-developed discipline has a body of related facts, explanations, and hypotheses which serves as a framework for designing and interpreting empirical research. New areas of research usually lack such a framework and, therefore, researchers often work at cross-purposes and disagree about methods and results. Preference research is no exception. Some of the deceptively simple methods and results are not capable of unambiguous interpretation. Various speakers at the Conference discussed the pros and cons of sales tests, surveys and consumer panels. The necessity was shown for an integrated research program that probably included all these techniques and that systematically explored the whole problem.

A second difficulty is the problem of communication among researcher This can be met only by hard work and by the willingness of all workers concerned to admit that "longissimus dorsi," "marginal rate of substitution", and "projective interviews" are all scientific terms of usefulness in defining and solving our problems.

The major contributions in meat preference research have come from various disciplines working together. I doubt if there is any place in preference research for workers too small to learn from outside their discipline.

The third difficulty is the problem of separating fact from fantasy. The fact that some of these fantasies carry the veneration accorded the aged makes the problem more difficult.

The fourth difficulty is the tremendous problem of studying the variability of human behavior compounded with the biological variations in beef. More about that later.

IV. Relations of Grade and Shear to Consumer Acceptance.

Data were discussed concerning the relation of grade and shear to laboratory evaluations and to consumer acceptance. These results have been recently published in Texas Bulletin 889 and Missouri Bulletins 651 and 652. I want to comment on them briefly as they illustrate some of the points just discussed.

This slide (Figure 1) illustrates two hypothetical relationships between grade and consumer acceptability. Mr. Cover tells me that hypothesis No. 1 was definitely held by a number of researchers at the beginning of the Cooperative Meat Investigations. Doubts crept in during those investigations and No. II was probably the commonly accepted hypothesis from, say, 1939 to the present time. Our results suggest that the No. II relationship is much too narrow and precise. This next slide (Figure 2) shows that the leaner the grade the more heterogeneous. Each bar shows the range in average ratings of either 10 or 20 loins by a panel of 60 Columbia consumers. This next slide (Figure 3) shows the same relationships for 84 loins evaluated by 266 St. Louis consumers. The shaded areas show the middle third of each distribution. Not only both Missouri panels but also a Texas panel of 40 showed the same pattern of results. The average rating of a grade falls as we move from fatter grades to leaner. But to say only that is to miss the main point. As consumers we don't buy an average grade; we buy a cut from a carcass. These bars give some indication of the range of possibilities. The surprising and important finding is that 2/3 of the Good loins were every bit as satisfactory as the Choice loins. Yet those Good cattle probably sold at least $2 a hundred below the Choice and the loin price differences would be several times greater than that.

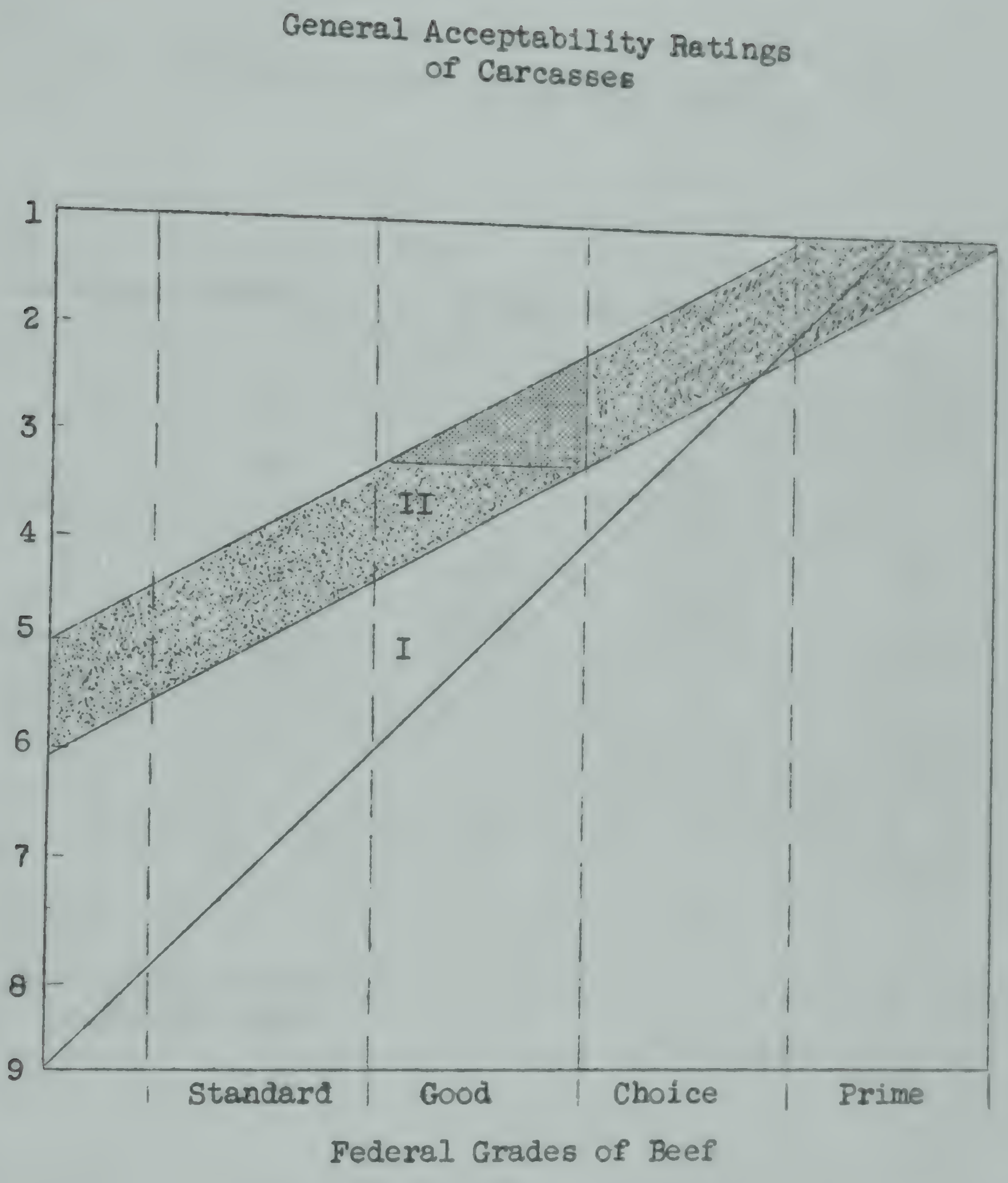
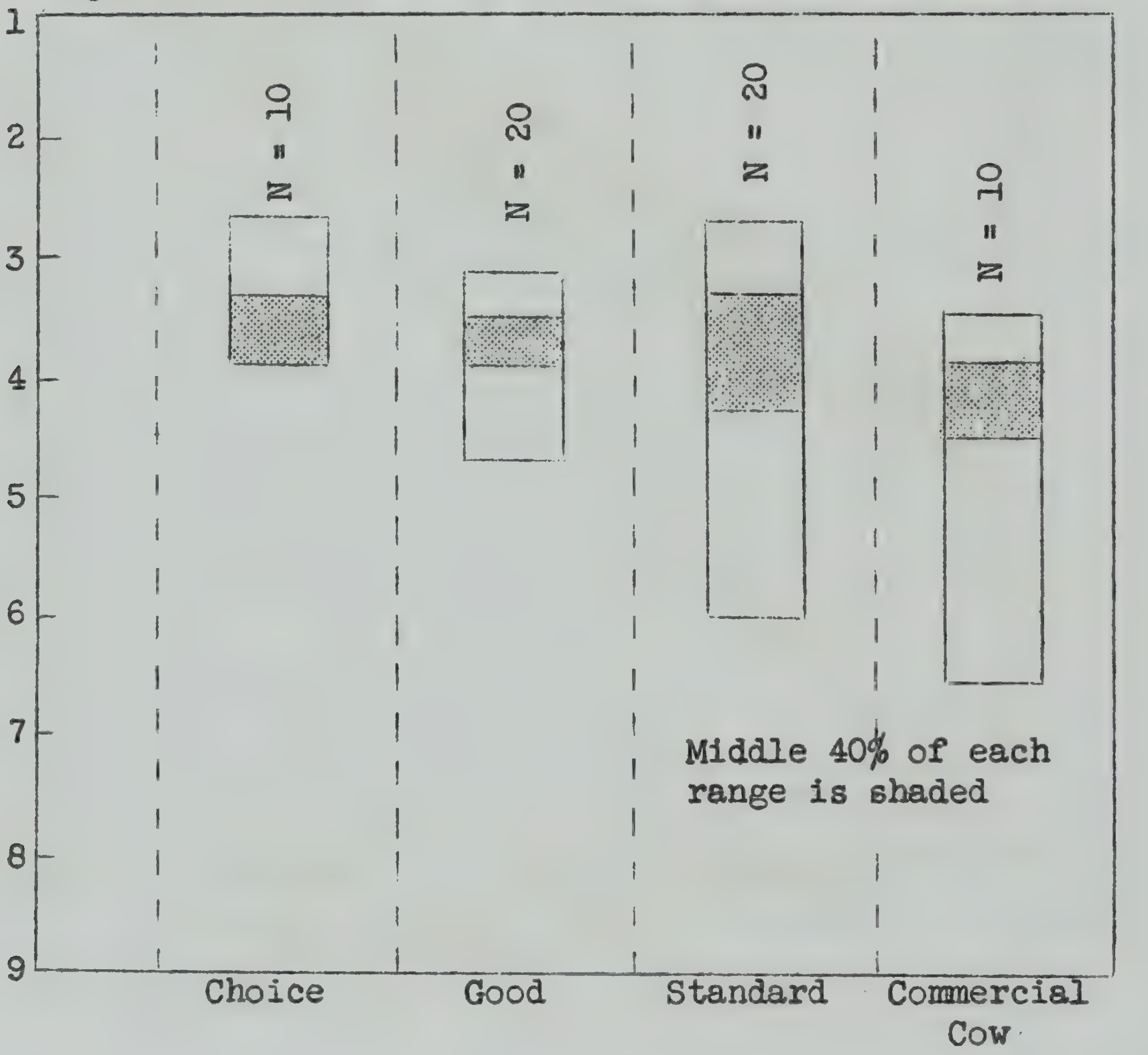


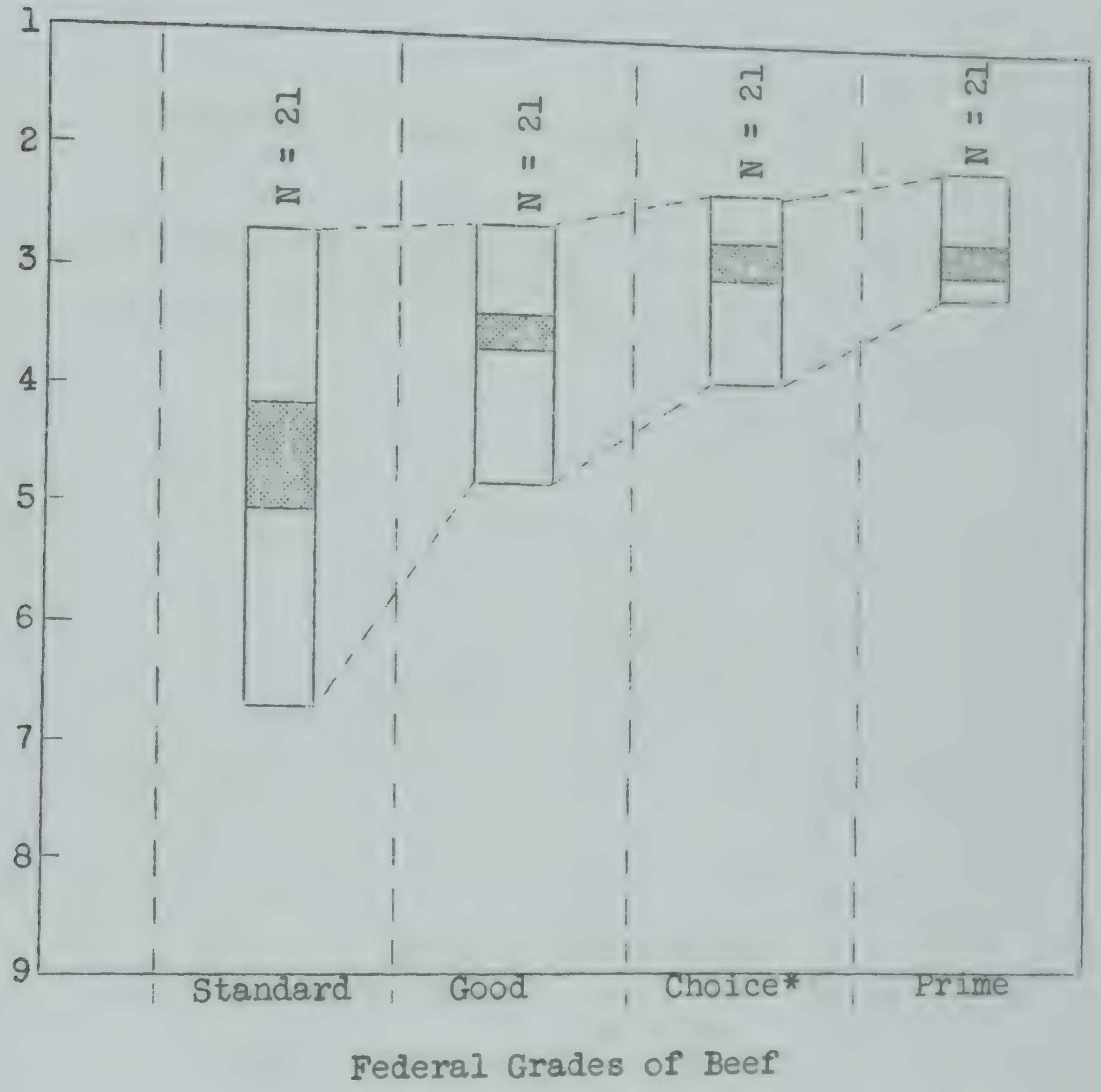
Figure 1. Hypothetical Relationships of Grade and Acceptability of Carcasses (Loins)

Mean Ratings of Carcasses by Men

Figure 2. Loin Ratings by Grade, Experience Panel.



Grades


General Acceptability Ratings of Carcasses by Men

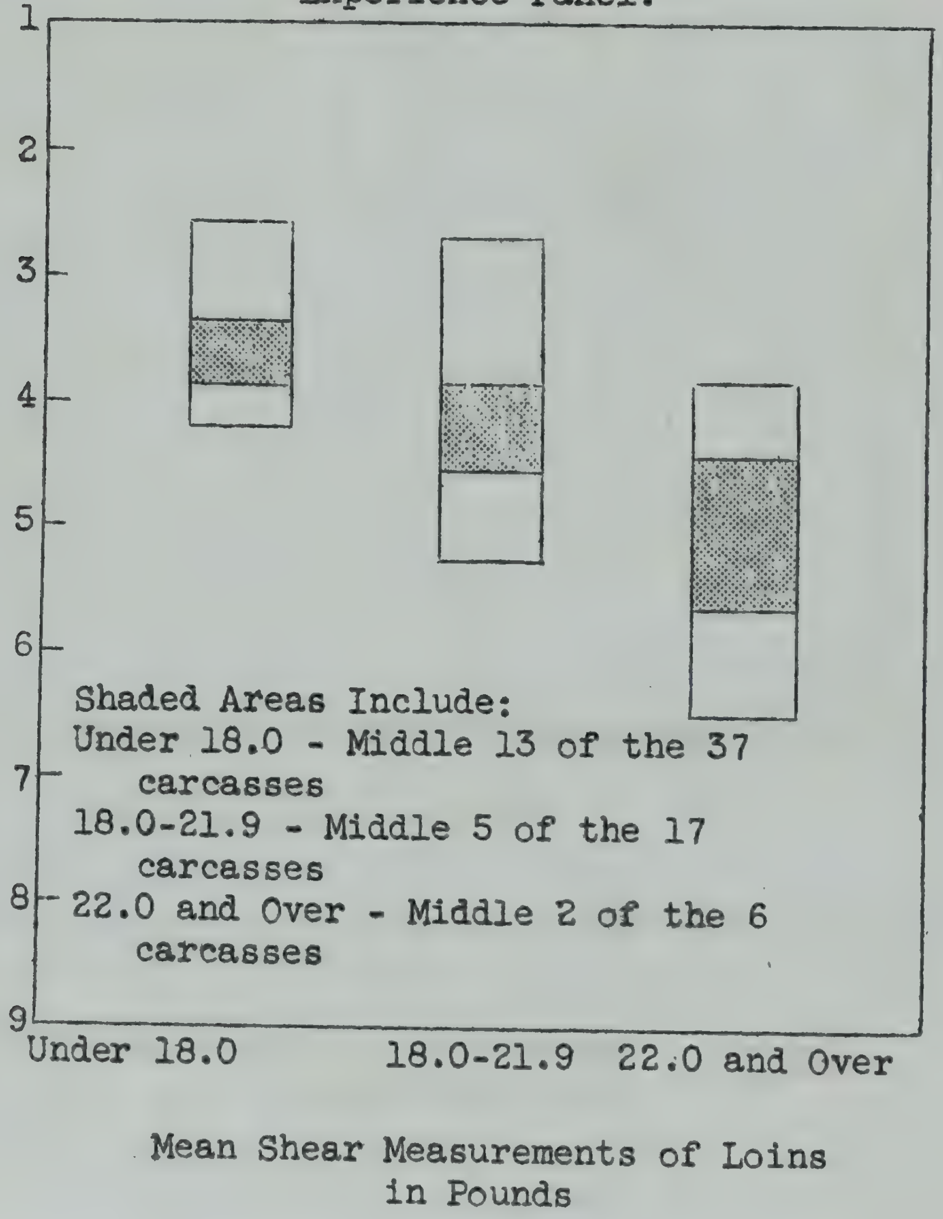
*Used only Choice$_0$ to give identical N for each grade

Figure 3. Distribution of Carcasses (Loins) by Grade, St. Louis Panel

Consumer acceptance appears to be a little more related to shear than to grade. This slide (Figure 4) shows the same 60 loins consumed by the Columbia panel classified by shear. Note that there are 37 loins in the group shearing below 18.0 pounds. These were means of nine shearings on the Warner-Bratzler shear of cores one inch in diameter. Seven of those 37 were Choice and 30 were of grades lower than Choice including 3 Commercial cow loins. The poorest of those 37 loins shearing below 18.0 pounds was rated just a trifle poorer than the poorest of the 10 Choice loins.

Men's Mean Ratings of Carcasses

Figure 4. Loin Ratings by Shear Group, Experience Panel.



This final slide (Figure 5) shows the 42 leaner loins of the 84 consumed in St. Louis classified by both grade and shear.

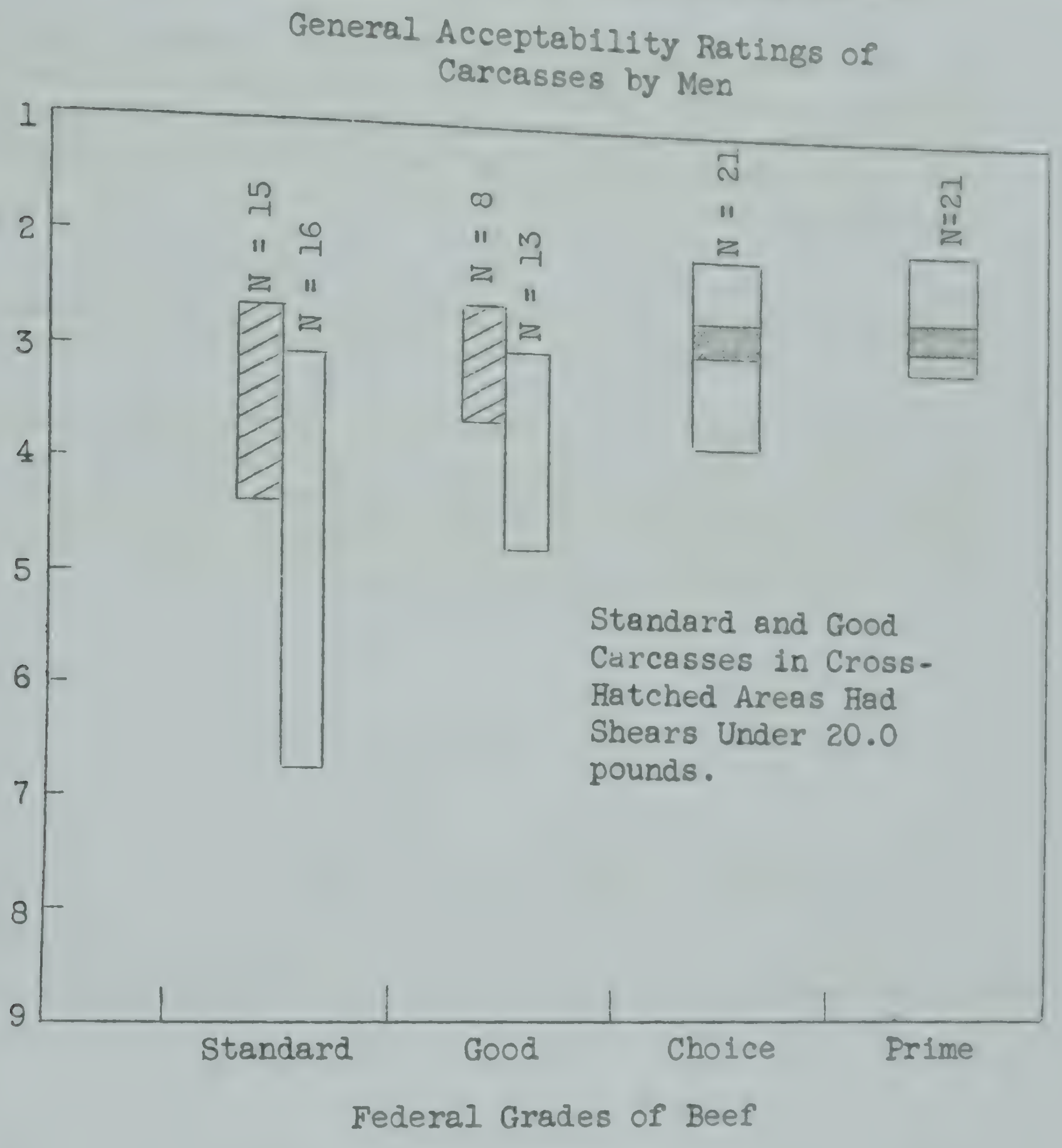


Figure 5. Relation of Carcass (Loin) Ratings to Grade and Shear, St. Louis Panel

The crosshatched bars show Standard and Good loins shearing below 20.0 pounds. Almost all of the 13 lower-shear, leaner loins were just as acceptable as the Choice loins. Neither shear nor grade has the accuracy we would like but both together have much more accuracy than either alone. For research purposes, I would suggest that shear measurements as well as grade should be used in identifying beef products.

V. Economic Implications.

The economic importance of a sorting system which would facilitate selling of acceptable Standard and Good cattle for what they are worth should be obvious to everyone. And the importance to the reputation of our beef or sorting out those poor Standards and Goods for special tenderization and fabrication should also be obvious.

To look for a moment into the wild blue yonder, I believe that you livestock and meats people can come up with the breeding, feeding, and processing techniques that will produce 98% of our steers and heifers as highly acceptable beef at an external fatness no higher than average Good and perhaps even leaner. I further believe you will have the sorting method to weed out that other 2% that didn't make it. As you develop these improvements, I suspect we preferenc researchers will be alongside testing this product and testing that product to determine what is an improvement and what is not.

The ultimate goal is all beef highly acceptable. Contrast this wit our present system of marketing several grades which are supposedly several degrees inferior to the most acceptable beef. Which system do you think will put the most dollars in livestock producers' pockets and the biggest smiles on consumers' faces?

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MR. MERKEL: Thank you, Mr. Rhodes.

Now for the technologist's viewpoint I should like to call on Professor Lyman Bratzler.

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THE UNIVERSITY OF MISSOURI CONFERENCE ON CONSUMER STUDIES AND MEAT QUALITY FROM THE TECHNOLOGIST'S VIEWPOINT

L. J. BRATZLER

MICHIGAN STATE UNIVERSITY

I found it difficult to separate the report of the Conference into the two aspects. It is difficult for the technologist to remain aloof from the economist's field of endeavor and I imagine that the reverse is also true to some extent. You have heard Jim's presentation and it is hoped that repetition and duplication will be at a minimum. An easy way to discuss the Conference might be indicated by the classification of the speakers, but that was not possible.

John C. Pierce was assigned the topic, "The History and Institutional Setting of Federal Grade Standards -- Development, Changes, Controversies and Future". He related how the first proposal was made in 1916 in connection with the establishment of a national market news service. The original standards were patterned after the Illinois work. However, Federal grading, as we now know it, was not begun until 1927. I thought it was interesting to know that the grading service was the result of activities on the part of the Better Beef Association. It was their contention "that if a system were developed for labelling the different qualities of beef so that consumers would have a reliable guide to identify the quality they desired, it would encourage the consumption of beef and indirectly encourage the production of better beef cattle". It is easy to see how these original objectives were instrumental in promoting quality measurements. The point was very well made that the original grade standards were based upon available information and as more data were accumulated, revisions were made. Generally speaking, these revisions were made for one of three reasons: (1) to reflect results of research as related to grade factors, (2) to clarify the intent or improve the application of the standards, and (3) to take into consideration changing production and consumer preference trends, particularly where grade ranges were either too wide or too narrow.

John made a point to the effect that the greatest limitation in the improvement of grade standards is the lack of accurate information. His Branch is looking to us for these data. If we would spend more time in attacking the problems involved and less energy in criticising the Service, I am sure that all segments of the industry would be indebted to us. This is true from the standpoint of both disciplines. For example, the Service would like more information on the attributes of meat that have the most effect on consumer preference. Another area is information related to the most practical width of the various grades. I would like to quote a paragraph from John's talk that brings the problem into focus.

"It is my sincere hope that the research of the technician and economist will bring about in the future a more objective approach than has sometimes been the case in the past. In the field of grade standards, rather valuabl time has been lost in an attempt to establish the fact that the present grading system or the standards were inadequate with respect to particular points. In many instances the deficiencies were quite obviously recognized and acknowledged by those intimately associated with the field of grading. Our files are well supplied with testimonials based upon both opinion and fact as to deficiencies in the present standards. However, our files are devoid of workable recommendations for correction of these same deficiencie

In An Economist Looks at Meat Grading and Consumer Studies, Mr. Gerald Engelman, Livestock Section, Agricultural Marketing Service, U.S.D.A. presented a thought provoking discussion of meat grading. He took the technologists and economists to task for expecting things from meat grades that are not logical. His definition of grading is "a process of segmenting a heterogeneous supply of a commodity into smaller, more uniform or homogeneou groupings which are more nearly substitutable for one another than with othe units of the total supply." I think that this definition should be kept in mind when we are quick to criticize the grading standards, methods, etc. If you do not have a copy of this paper, I suggest that you write to Mr. Engelm for one. It should be a "must" for every graduate student in meat and also for anyone interested in consumer preference as related to meats.

He discussed the differences between beef grade standards and thos for pork carcasses. The respective subjectivity of the former and the major emphasis on objective measurements for the latter were compared. The questi was raised as to his opinion on the inclusion of more quality factors in por carcass grades. He believed that some of these measures should be incorporated into pork carcass grades. It is almost impossible to obtain an accurat measure of the quality factors that are important in the establishment of a beef grade. The variability between tasters, for example, introduces considerable error into the results. This variability should be considered before the inadequacy of grade standards are inferred.

Engelman believes that too much reliance is placed on the adage: "Grade standards should be based on consumer preference". This assumes that all consumers have the same preferences, whereas a more nearly true assumpti would be that all consumers have different preferences. Inasmuch as grading attempts to segregate the variable population into units composed of more uniform individuals, each grade distribution is different from that of any other grade. When the various attributes of color, juiciness, lean-fat ratio, etc. are included, many consumer preference studies have emphasized that different consumers place different evaluations on each of the several attributes. He makes this statement: "Grade names are not the substitute for consumer education; it has been thought they should be. They are simply words, the vehicles through which consumer education is possible."

While the following paragraph may exaggerate the problem, I think it points out the dangers from being too critical of grade standards: "In closing I would like to mention a taste test which is sometimes done in anim husbandry meat classes. Selected beef, pork, and lamb roasts all cooked at the same temperature, about the same length of time, and are served to these students. I am told that about three-fourths of the students are unable to distinguish between beef, pork and lamb. Now if I may paraphrase some of th criticisms of the grading system to this situation. It is quite obvious that this test raises some questions about the efficacy of our classification system in classifying meat according to the categories of beef, pork and lamb. Certainly this suggests that this system is not necessarily based upon consumer preferences! This classification system - beef, pork, and lamb - obviously does not protect the consumer. It is also quite obvious that different products being compared actually are not discernably different in the characteristics being tasted. In the final evaluation, it certainly seems evident that we need a better system of classifying meat than the simple beef, pork, and lamb system."

The final session of the conference was entitled, "Design of Product for a Market Economy." A psychologist, a technologist, and an economist discussed this subject. Mr. Richard Seaton, U. S. Army, prepared the paper dealing with the design of products from the psychologist's view. According to him, new or revised products must have sensory or aesthetic appeal in addition to desirable physical properties. A new product can not offend the public preconception of desirable or customary qualities. For example, a new meat product should not be green! Some new dimension should be given the contemplated product, but this addition should not be too different. Some of us can remember what happened to the Airflow Chrysler. Evidently the Edsel people remembered, because they introduced conservative changes in their new car.

Simplification is a type of change that may be said to have positive value. Boneless hams, pre-cooked hams, and similar meat items have this characteristic. Bob Graf's "6-way" beef is another approach to this problem. While he may be able to convince you and I on its merits, it is doubtful whether the consumers of today would accept only six kinds as cuts of beef. In all probability, the change would be too great. Choice and monotony should also be considered when simplification is being contemplated, according to Mr. Seaton. The consumer may be offered the same product in different containers or packages which affords synthetic choice to relieve monotony. Blander foods may be repeatedly consumed over longer periods without resulting monotony effects as compared with higher flavored foods. Another psychological attribute that a product might incorporate is that of participation. The so-called premixes is an example of this type product. Some require the addition of one ingredient to satisfy this desire on the purchaser's part. Others may include little packets of spices, etc., to be added at the user's discretion.

Another set of factors to be considered when developing a new product can be termed social. This attribute is exemplified by the personal endorsement type of promotion. Also, serving a prepared meat product to guests may increase general consumer acceptance if it is done by prominent people or community leaders. Finally, a product must say or convey something to the consumer. A filet mignon conveys social power if some one else is paying for it, and purchasing power if paid for by the eater. It is said that ham conveys a homey, festive occasion -- minute steaks, hurry and get on with business -- and pot roasts, reassurance and sustenance. "A new product must be designed to meet the perceived and subjective needs of the consumer and these needs are psychological in character."

Our George Wilson presented the Role of Technical Developments in Meat Standardization. He discussed the need for more precise measuring too as related to determination and standardization of quality in meats. Enzymatic tenderization, increased shelf life through packaging improvement, and improved standardization through different processing methods were evaluate Suggested possible techniques were radiation, photometric scanning devices and also a "photocomputer" to give a score for carcass conformation. His summary is as follows: "It would appear that the role of technology in meat standardization is two-fold. The immediate need is for advancements which will more nearly assure the consumer of satisfactory eating quality. This may be brought about by ante or post mortem treatment of the meat, and/or by a reclassification of meat cuts within and between grades. A simultaneous effort should be made, and is being made, to more fully understand the complexities of the product with which we are concerned so as to provide simple non-destructive, objective and direct methods of determining the acceptabili of meat."

The over-all summarizing of the Conference was in the able hands o Mr. Elmer R. Kiehl, Agricultural Economics Department Head, University of Missouri. The historical development of beef grades was traced and the point made that they were in the beginning producer oriented. "The genesis and evolution of beef standards was a part of the whole process of urbanization and industrialization of society. This process is continuing. Many people believe that self-service meat merchandising and frozen meat processing are forces stimulating a serious reappraisal of the orientation of grades." He went on to list the deterrents to progress in the beef grade area as follows: connoisseurs, those who think that beef is a "prestige" product, cold blooded nutritionists, technical meat experts, breeders and livestock fanciers, processors, and economists. Each of these groups has its own interpretation of the problems involved. "It is not a matter of completely reconciling the various viewpoints, but one that strips off the non-essentials to permit an analysis that attempts to reveal the real relationships between the consumer and the product."

His concluding paragraph is a direct challenge to the members of th Reciprocal Meats Conference. It is "The most promising methodological improvement in the near future is a team approach that systematically discovers and remedies gaps in our knowledge. Probably a primary cause of the deficien of answers in this field is the fact that questions have been confined within disciplines. Therefore, some of the really relevant questions have not been asked. Answers to these questions remain for the future."

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MR. MERKEL: Thank you, Lyman, for those very interesting remarks.

The Executive Committee felt that, since last year the discussion was cut considerably short, we would design a new type of progra this year and they chose the Consumer Research Committee because of the situation last year; consequently our discussion period will be much longer than it has been customary for this conference in the past. Our discussant, who will take up the challenge that has been presented by both the economist and the technologist, is Mr. Gene King of Texas A. and M. Gene.

Mr. Chairman and friends of the Reciprocal Meats Conference, I want you all to know that I was assigned as discussion leader of this portion of your program by an overwhelming majority vote of the Executive Committee last spring. Don Naumann was very much opposed to the title given this portion of the program, but I do not know of a more appropriate title since the conference was held on the University of Missouri campus and the Missouri people did most of the work in organizing, conducting and publishing the results of the Conference. Jerry Engelman was responsible for the idea of holding such a conference, with the explicit purpose in mind of bringing together all disciplines working in the field of consumer research. Missouri was the central location. It was thought that if the various disciplines could be brought together to exchange ideas relative to methodology, interpretation of results and plans for future research in the field of consumer preference studies, a more uniform, coordinated program could be accomplished. The most important objective of the Conference was to encourage cooperative research between disciplines within an institution first, and secondly, cooperative research between institutions. If all or part of this objective was accomplished, then the Conference was a huge success. I know that the Conference was a huge success. There were 8 disciplines represented at the Conference from 13 states, 6 U.S.D.A. divisions, 2 business organizations, the AMIF, Quartermaster Food and Container Institute, National Live Stock and Meat Board, with a total of 56 in attendance.

Traditionally, research workers have been afraid of someone "sealing their thunder", which has resulted in the hoarding of methods and results until a piece of research is published. If the various disciplines will work together as a team, much more can be accomplished in a shorter period of time on any given problem.

Consumer research has certainly had its share of criticism, but only a small percentage has been constructive. It is very easy to criticize, but very difficult to give a solution for the criticism at the same time.

Jim and Lyman have each done an excellent job of summarizing the Conference in well organized prepared papers. Jim has summarized some of the accomplishments of consumer research, such as the importance of tenderness, leanness, consumer behavior and product design. He also stressed a list of some things that preference research has not accomplished, such as means for improving the grading system, variations in preferences, how to assure beef quality, and solution to many merchandising problems. Several difficulties in consumer research were discussed and I would like to emphasize one and that is the importance of various disciplines working together, rather than working independentl and being too small to learn from outside their respective discipline.

Lyman has done an excellent job of summarizing the papers th John C. Pierce and Gerald Engelman presented on Federal Grades, as wel as the three papers on "Design of Product for Market Economy", present by Richard Seaton, a psychologist; George Wilson, technologist, and El Kiehl, an economist. I certainly agree with Lyman that it is very diff cult to separate the report of the Conference into two aspects--the economist's viewpoint and the technologist's viewpoint. In my opinion very pertinent statement made by Lyman was "if we would spend more time in attacking the problems involved and less energy in criticizing the Grading Service, I am sure that all segments of the industry would be indebted to us". From Lyman's discussion you have observed that many o most of the problems encountered in consumer research are the same from the technologist's viewpoint as they are from the economist's viewpoint I would like to re-emphasize Lyman's closing statement which is taken from Elmer Kiehl's paper and is a direct challenge to the members of th Reciprocal Meat Conference. It is as follows: "The most promising methological improvement in the near future is a team approach but systematically discovers and remedies gaps in our knowledge. Probably a primary cause is the deficiency of answers in this field is that the questions have been confined within disciplines."

I believe that the Executive Committee has provided ample time for discussion from the floor, and I am sure that many of you are anxiou to begin the discussion, so at this time the remainder of this portion the program is yours.

MR. KING: I have nothing more to add, I believe, to what these two gentlemen have already mentioned.

There are several in the audience who attended that conference, and I am sure that they would like to make some comments in addition to some of you who were not in attendance who would like to bring out things. But before opening it for discussion from the floor, I should like to ask a question of Jim, that is, what degree of tenderness do you consider an 18 to 20 pound sheared ham. Is it tender? Very tender? Medium? Or tough?

MR. RHODES: You are referring to your particular scale. I think that we would have to classify this as tender. From the consumer' viewpoint this is an entirely acceptable degree of tenderness.

MR. BRATZLER: That is on the inch score that you are talking about?

MR. RHODES: Yes.

MR. KING: Are there any questions from the floor?

I believe that everyone wants to cooperate with the schedule, Vern, to be sure to get out at 11:45.

MR. DEATHERAGE: Well, I have pleaded for this group to do one thing a good many times, and I think this is an appropriate time to do it again. We have been interested in this thing for a good many years. It has not been too many years ago when it was almost impossible to publish in a scientific journal some of the comments made here this morning. I remember that just two or three years ago we pointed out that marbling is a sex characteristic, but to get that in black and white in a scientific journal was almost a monumental task. So we are making some progress.

But there is a plea that I should like to make and it concerns grades. This word has been tossed around here this morning, and I think one of the greatest bottlenecks is the word grade. If, in reporting in a scientific publication, a person is so wedded to the use of U. S. Prime, Choice, etc., I should like to see him at least include data on those animals as to why they were graded that way. Was it because of youth? Was it because of fatness? Was it because they were Herefords and not Holsteins? That is what we need to know, you see.

A chemist, whom I presume I represent here this morning, would never think of publishing anything in mixtures if he could avoid it. In other words, you have a heterogeneous terminology in this word grade; yet it is impossible to ferret out any of the basic facts in most of the publications that use the word grade. I would make a plea to this whole group that when anyone publishes a paper that gives data on consumer acceptance, bacteriology, or anything on meat and it uses the word grade, that he at least include data as to why it was graded as it was.

I remember that years ago the late Paul Derkal instituted with our group a rather simple study on this grading problem by just simply comparing Herefords and Holsteins on the same management and I would defy anyone in this group to tell the difference between a Holstein and a Hereford, and I would say the same for bulls of which you know a little yourselves.

MR. KING: Are there other comments?

MR. W. Y. VARNEY (University of Kentucky): I should like to direct a question to Mr. Deatherage. He made a statement in this conference a few years ago that went something like this: Tenderness is the sole factor if flavor is not objectionable. I should like to know on what basis he made that statement.

MR. DEATHERAGE: Well, I think that was confirmed this morning, wasn't it? You see, if there is any factor in any product that makes the product objectionable, then that throws it out. If you were to itemize the important attributes -- and this is true of any food item -- it does not necessarily hold only for meat. What is the most important attribute of a gelatin dessert, you see? What is the most important attribute of a salad dressing? I would say that the most important attribute of a salad dressing is that it not be rancid. Then we start from there.

In the case of meat I think your consumer tests show and I think the inference was here this morning that if the meat is not tende it is not satisfactory, and so I think we have to direct our attention. This is the whole thing of picking out any food item and doing the best you possibly can to get, if you will, the psychological terms with refe ence to the particular food item. What is the most important thing in sauerkraut? What is the most important thing in anything? You see it will be different for different food items.

Flavor was absolutely nothing in peaches because they set up the grades on the old California cling peach. Well, I could wax hot on this one but I won't because I don't like the California cling peach, bu I certainly like the freestone. It would not grade but it is awfully good.

MR. KING: Are there any other comments?

MR. KLINE: I don't know, maybe it was not in the Missouri conference, but one time something was said about changing the U.S.D.A. grade. Is John here? There he is.

MR. J. C. PIERCE, JR.: I am not under the table yet.

MR. KLINE: Reference has been made to grading quality first with different degrees of conformation as secondary attributes to grade. I am wondering if any followup has been made on that, Johnnie, or what is the thinking in Washington on the grading system at the present time with regard to changes that might be contemplated.

MR. PIERCE: Well, Ed, a little status report is appropriate on that. I hardly know where to start because the system that Ed refers to may be something that is a little foreign to many of you, and I have found, in working with systems a little over the past two or three years, that they hit you pretty cold. It takes a little better salesman than I am and somebody who can explain it better than I can to get the story over in a very few words so that you will understand how it might work, but I will try it first and then comment on Ed's question.

You know, first of all, this is the first time I have been up before this group now in the day and one-half. This morning I have been trying to decide whether or not we were being panned a little, Mr. Beard, at different times, needled, or whatever the word might be, and I catch on a little slowly; so I am not quite sure.

I think that basically we are all trying to get around to getting a better answer to some of our problems and, as I have said many times, we have more problems than almost anybody. Some times we try to take what we have and read a great deal of precision into it. That is what we often times try to do with this grading systems. I was grateful to Lyman for pointing out that, after all, all a grade does is take the whole population and segment it into groups. It segments it into groups according to certain characteristics.

The inference was made earlier here that some of our research friends found it a little perplexing that these grades are not homogeneous one within the other. That is, all these units in here are not homogeneous. I do not know how we could ever expect these grades to be homogeneous within grades, if you give a little thought to what we are trying to measure. We are merely trying to segment the whole population; consequently what is the range? The range is about as much as we think will be relatively interchangeable with various groups and all consumers don't want the same thing, of course. So naturally this is heterogeneous. It is a matter of just how heterogeneous it may be. If it gets to be too heterogeneous, if the range is too wide, people may start to ask you to split it in two in the middle. That may come from a producer group who have one idea or it may come from a consumer group who have another idea.

But with that premise, if that is the width of the grade and it is heterogeneous all the way, it must not be too surprising to find that the distance from the middle of this grade to the middle of this grade is about equidistant from the bottom of one grade to the top of the other. Consequently if you are comparing adjacent grades as long as you are comparing the same range of quality you are going to be talking about the same thing, as though you were talking about the bottom end of a grade and the top end of a grade.

What connection has that with Ed's question? Merely this: I think we have been aware in the department for a long time that as long as we try to bring characteristics together into one common denominator that are as different as conformation and quality, one affecting yield of salable meat from a carcass, the ratio of meat to bone, preferred cuts to less preferred cuts and quality, ostensibly measuring eating quality as best we know how -- as long as we tend to put these things together into one common denominator we are always going to have a compromise.

So it was with this objective that some few years ago we started to try to find out first of all what are the characteristics that affect yields of retail cuts from a carcass. How important is conformation? How important is thickness of fat? Can we get objective measures of these characteristics? It was our thought that if we got these answers we might some time come up with a system that would work a little bit like this. We don't change too much in this business, I guess; so we were not proposing to change these quality lines. This would be Prime, Choice, Good, Standard and what have you. We were hoping to develop a system that would enable the trade within this quality designation primarily to have some measure of cutout, something that could be related much more closely to retail value based on the quantity of salable meat and where it was located.

We have worked quite closely with the American National Cattlemen's Association. They have taken a great deal of interest in this. We reported the results of some three year's study this last year. I didn't say how this would operate, did I? First of all, our idea was that each grade would break down according to the cutout. This might be 1, 2, 3, 4 or it might be A, B, C, whatever designation you might care to put on it. These Prime 1 or Prime A, Prime 2 or Prime B, or whatever they might be, would have a different cutout from the next one.

Our measure of cutout has been the retail cuts from the round loin, rib and square cut chuck. We have found considerable variation in the retail yields, even within a grade, running up as high as 9 and 12 per cent of the carcass weight. I have some figures that we have pu together just within the last three months on this. We made this propo I guess merely as an idea to the American National last year, backing i up with such data as we had at that time, and they went on record by passing a resolution requesting the department to proceed with the necessary field testing to determine the adequacy of such a system or to develop such a system.

Since January we have been working with various retailers, cutting as many Prime, Choice, Good, and Standard carcasses as we could line up with these various retailers. That is a little difficult because it interrupts their schedules. We have had some difficulty in getting the numbers that we would like to study.

Essentially at this point, Ed, we are testing our ability to predict these various cutout groups. So far we have been very pleased with our ability to do this. Unfortunately, it is somewhat on the subjective basis, too. The objective measures that we studied were not as good as our subjective judgment. As to the magnitude of some of these differences, I think I have a few of them here. I will put two or three on the board. Let's take the Good grade as an example. In our high yielding group -- this is on 45 carcasses -- do you recall?

MEMBER: Thirty.

MR. PIERCE: Thirty on these figures here. Of the high yielding group, 64 per cent of the carcasses were made up of retail cuts from the round, loin, rib, and chuck. The average group came out 61, the low group came out 59. Now averages represent a pretty typical picture of what we have found in all of the grades. In other words, there is about 5 to 6 per cent to work with in yield of retail cuts from these groups within the grade. Now the over-all range on an individual carcass basis is considerably greater, running up even to 9 to 12 per cent within some of the grades. Where we are on this is a little hard to say in answer to your question that precipitated all this discussion.

We hope to complete a few field tests of all the grades at least in the next couple of months. We will take that information back to the American National who asked us to put it together. Perhaps base on the reaction we get there and the consistency of our data between now and then we may come out with a proposal in this general area. If we do certainly we want you folks to understand fully what we are getting at. We would like your comments. You will have ample opportunity to comment I think you should recognize that this will be an extremely controversia issue. Packers -- certain groups of packers, at least -- will look upon this for just what it is: Another move to take some of the elbow room out of this business. In other words, if someone is selling his meat under a national brand, I would assume that he would not take too kindly to this system, because he will see in it more precision in the grading system, taking a little of the elbow room out of it.

By the same token I think it is absolutely essential that we go in this direction if we are going to get anywhere with this program of breeding a meat type steer. If we are going to emphasize muscle development, I don't think we can get any place omitting the quality aspect. This does not omit it. It just enables you to select in that direction, and certainly if we are going to get any place, if the producer is going to have an incentive to produce this meat type steer, our marketing system has to figure out some way of identifying it.

Thank you.

MR. KING: Thank you, Johnnie, for those very appropriate remarks.

MR. MERKEL: Thank you, Gene, for leading the discussion.

I want to thank the entire Consumer Research Committee for all their suggestions. They were very helpful in planning this program. In fact, most of the individuals suggested the type of program we have had.

Thank you very much.

CHAIRMAN CAHILL: The conference thanks you and your committee, too.

I see a couple of new faces that have come in today and I should like to present them. Mr. Fred Beard, Chief of the Grading Service. Some of you may not know him. He is right there in the center of the room. (Applause)

We heard yesterday about a man who has been at every conference. Not only has he been here in person, he has had a display with him, and that has come to pass again in this Eleventh Conference. May I present Mr. George Tupper, of the Russell Harrington Cutlery Company. (Applause)

The next item on the program is to elect a chairman for the conference in 1959. May I ask Mr. Burdette Breidenstein, Boyd Ramsey, and Max Judge to act as a tellers committee, and we will proceed with the election of a chairman from the Executive Committee.

We have listed here the new Executive Committee which you elected yesterday. Just to make sure that everyone is acquainted with these individuals both by name and by face, may we ask Charlie Adams to stand, please? Ernie Briskey. Bob Deans. Bob Merkel. And George Wellington.

MR. KEMP: Mr. Chairman, will you designate which two of the are the holdovers?

CHAIRMAN CAHILL: Adams and Deans.

I suspect that it is appropriate to remind ourselves that no more than five individuals from each institution are eligible to vote in such an election.

(Ballots were cast.)

CHAIRMAN CAHILL: May we have your attention, again, please? There is something here of importance to each one of us if we propose t keep this Personnel Committee active and to keep the data on all of our associates up to date. Professor Kunkle, do you have some ideas to share with us?

MR. KUNKLE: I made the threat yesterday that we would go hom and try to publish another one of these News Letters, errata sheets, whatever you want to call them. The thought is that we ought to have th changes that already ought to be made in this directory. I have about four of them, and if you need to take the pressure off, I will promise to get Marshall Heck and Carl Roubicek in here in the A section. If the are others, we need to be told about them.

Names over and above the 134 that are included here plus the two just mentioned, we will need as new men and we would like to have th names of their institutions. Now I promise that we will not proselyte or in any way divulge any so-called confidential information about job opportunities that you may have on the hook, but if there are those of you who are looking for work, we will be glad to have your names in orde that we can try to match them up with some of the requests that have bee inkled.

I think that is enough to say. I am not wearing any spines, and if you want to come and touch me, I will be gald to try to keep a record here in my pocket during the rest of the afternoon.

CHAIRMAN CAHILL: In setting up this program, we tried to leav a little room, providing we were good boys, that is, a little leeway; so Don, we have 45 minutes left before noon, scheduled for your committee. We are ready to hear what we ought to do in the teaching field.

MR. H. D. NAUMANN: Thank you a lot, Vern.

I can say many things in introducing this topic and I can say many things in introducing Davie Mackintosh but I choose to let him speak for himself. Davie Mackintosh is going to discuss with us an off-campus meat course which they offer at Kansas State College. Professor Mackintosh.

MR. MACKINTOSH: Mr. Chairman, Mr. Naumann, Visitors and Members of the Conference: There is just one thing that Larry didn't menti

MR. KUNKLE: I hope there is only one thing.

MR. MACKINTOSH: Well, one at least that a Scotchman would notice, and that is that you did not say anything about collecting the $2.

MR. KUNKLE: I haven't any pursestring connections.

MR. MACKINTOSH: The subject that I have been asked to discuss is entitled, "An Off-Campus Meat Course."

To me our Lamb Council is doing a superlative job. They have certainly shown the public 15 points all right, but they failed to answer the question when it was asked: What are they doing about helping the producer to throw that point or to meet it? I should like Biglin to answer that, and I am still interested in it, because I think that is where the work of the lamb association begins today in the production of more and better lambs. I am really worried about merchandising those lambs.

This is a little remote from the subject here, but I just had to mention it. I didn't try to get it in before, because I knew the Chairman would cut me off if I got up. (Laughter)

In our teaching work I think that we are in somewhat a similar position to that of the lamb association and many other associations. We are preparing our students, whether they are undergraduates or graduates. I think, however, in many cases we spend possibly a little too much time thinking about our graduate students when we should be emphasizing our undergraduate students. The course that I am going to discuss here is primarily designed for graduates.

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AN OFF CAMPUS MEAT COURSE

DAVID L. MACKINTOSH

KANSAS STATE COLLEGE

It is highly possible that Off Campus Courses existed even before the day of Campuses, but in the years since the centralization of our Educational system on campuses, Off Campus courses have continued to exist. For over sixty years the University of Aberdeen has required agricultural studen to spend periods of three and six months with estate managers or farm managers. There was a close contact between the Institution and the Estate repre sentative and the location was selected by the institution and not by the student. Charles F. Kettering, in a recent article entitled "Future Unlimited," has the following to say regarding Off Campus Courses. "One of the most useful methods of education is to take the student out of the class room for part of his learning. This is called Co-operative education. This system was first introduced fifty-two years ago by Dean Hermann Schneider in the Engineering School of the University of Cincinnati. Later on, it was introduced at Antioch College, which is a co-educational liberal-arts college and at the General Motors Institute in which we have 3600 students. I would like to see a far broader use of co-operative education. Under it the studen learns more than rote. He goes out and joins the actual practice of industri or social or professional life. It helps him develop what Harlow Curtice calls 'the inquiring mind', because he finds out that the slide rule is not applicable to all problems. He finds, in fact, that many people do things successfully in absolute contradiction of the slide rule and the book formula

Some years ago, we at Kansas State College, felt that although we were fairly well equipped to teach Principles of Meat, and Meat Processing, there was a far cry from our laboratory work and the application of the same principles in the commercial world. Field trips offered some help, but in a few cases such field trips brought about more confusion than help to the individual. We were also interested in some manner of selling to students the wide opportunities in the packing house field. It was our idea that the plan involved should first of all be interested in such a cooperative venture, and we also felt that the plant involved should be large enough to include most packinghouse operations, but not so large that the student would become lost as an individual. Arrangements for such a course were completed in the sprin of 1951 but the flood of that year brought disaster to the plant involved and it became necessary to look elsewhere.

Course number 485, Meat Packing Plant Operations, has been in effec since 1952. It provides from 2 to 6 credits, with a minimum of 4 weeks super vised study for each two credit hours in a commercial Meat Packing Plant. This arrangement of from four to twelve weeks of actual packing house observation is designed so that the summer months may be used in this manner, and the student may enroll for 2 - 4 or 6 credits. Our present arrangements are with the Arkansas City, Kansas plant of the Maurer-Neuer Corporation, and has proved to be a most happy one. The one major drawback to the present arrange ment is that the plant is located 150 miles from Manhattan, but that too may have its advantages. The student enrolls in Manhattan, and proceeds to Arkansas City, where he is free from all or nearly all resident red tape.

Arrangements are made well in advance of the time for the student to report to the plant, and when the student does report, he is accepted as a student in the sales trainee program. Since the time in residence may vary from four to twelve weeks, the program of study is made out for each individual, bearing in mind the departments in which the student is most interested.

In general, the plant operations are divided into 22 departments, and the student receives a detailed outline of his whereabouts within the plant for his entire stay. This detailed plan is carefully worked out by the personnel manager so that the student will have an opportunity to make the most of his time. For instance a man enrolled for eight or twelve weeks will have ample time to cover most of the departments and even spend a full week in the department or departments of his choice. On the other hand, a man enrolled for the minimum of four weeks will cover fewer departments and spend not more than two or three days in any one department.

While the contact man is the personnel manager, the student reports each week to the Product Man and meets the Supervisor and Foreman in the department. He is accepted by these men as a member of the plant staff, and while the student may not participate in the actual work of the department, he is there to observe and ask questions and receive explanation. If a suitable explanation is not available within the department, the question involved may be straightened out in an evening session or the regular Saturday morning conference with the plant manager, personnel manager, and each of the foremen with whom the student has been working during the current week. The student is also required to make detailed written reports of the week's observations, a copy of which is forwarded to Kansas State College. Our relationships with the company have been of the best, and each student who has had the opportunity to enroll in this course has been most enthusiastic about the entire setting. We feel that there is ample room for more such courses and the field of meat is particularly adapted to this type of cooperative education. The following are suggestions for any interested party. (1) The plant should not be too large. (2) The cooperation from the plant management should be voluntary in order to have their best interest. (3) The work must be well organized. (4) The work must be well supervised from within the plant, and (5) It must be adjustable to meet the varying needs as well as available time of each student. The results will vary with the attitude and initiative of the student, but if the student has been well founded in the fundamentals of Meat Processing he cannot help but acquire a much deeper picture of the industry.

I have circulated two outlines that have been prepared for students in this particular course. The one outline covers an eight week period, while the other covers a minimum four week period. It should be pointed out that this outline includes only the schedule. In addition to this schedule the trainee receives a well prepared outline for each department with numerous questions on the activities of that department as a means of trying to develop that "inquiring mind" that we referred to earlier. Naturally the eight week period offers much greater opportunity for variety as well as detail, than does the four week period. I am sure that any graduate student in the field of Meat can be influenced greatly by such an opportunity to observe and in a be a part of plant activity.

4 WEEK TRAINING SCHEDULE

Graduate study of meat packing at
Maurer-Neuer, Arkansas City in co-
operation with Kansas State College

DATE	DEPARTMENT	SUPERVISOR	PRODUCT MAN
6-9	Stockyards and livestock buying	Bill McCulley	W. D. Baucus Sam Davis
6-10	" "	" "	" "
6-11	" "	" "	" "
6-12	Kill Floors & Pork Cut	George Hanshew	Sam Davis
6-13	" " " "	Jan Murphy	Karl Faidley
6-14	" " " "		Perry Martin
6-16 through 6-20	-- Attend Reciprocal Meats Conference-Chicago, Ill.		
6-23	D & F Cellar	Carl Gray Clarence Brown	K. Faidley G. Cochran
6-24	" "	" "	P. Martin
6-25	" "	" "	" "
6-26	Smoked Meats	Charles Reid	Karl Faidley
6-27	Smoked Meats	" "	F. Cochran
6-28	Sliced Bacon	Kenneth Dubach	P. Martin
6-30	Beef Department (Coolers	James Bennett	Sam Davis
7-1	" " (Boning	Kenneth Koenke	G. Simmons
7-2	Quality Control & Research	Fred Cochran	
7-3	Sausage Manufacture	Dick Knowles	F. Cochran
7-4	Quality Control & Research		F. Cochran
7-5	Sausage Manufacture	Dick Knowles	F. Cochran

8 WEEK TRAINING SCHEDULE FOR ____________

For graduate study of meat packing at Maurer-Neuer

DATE	DEPARTMENT	SUPERVISOR	PRODUCT MAN
6-4	Stockyards	Bill McCulley	
6-5	Beef Kill	George Hanshew George Trenary	Sam Davis Hal Helchen Tom Points George Simmons
6-6	Beef Coolers	Kenneth Koenke James Bennett	" " " "
6-7	Beef Boning	James Bennett Kenneth Koenke	" "
6-17	Beef Coolers Beef Boning	K. Koenke J. Bennett	" " " "
6-18	Pork Kill	George Hanshew George Trenary	Karl Faidley Frank Wilson
6-19	Pork Kill	" "	" "
6-20	Pork Cut	" "	" "
6-21	Pork & Beef Offal	" "	Beef-S.Davis Pork-K.Faidley
6-24	Ham Boning Lard	Carl Gray " "	Karl Faidley Frank Wilson
6-25	Smoke Pork	Charles Reid	" "
6-26	Bacon Press & Bacon Slice	Kenneth Dubach	" "
6-27	" " "	" "	" "
6-28	Sausage Prod. including grinding, chopping, stuffing & cooking.	Jim Boyd, Gen. Foreman Fred Fowler Melvin Wolf Dale Mason	Fred Cochran
7-1	Sausage	" " " "	" " " "
7-2	"		
7-3	Vac Pac (self-service lunch meats)	" "	" " " "
7-5	Sausage Peel & Pack	" "	
7-8	Bacon Curing	Clarence Brown	Karl Faidley
7-9	Bacon Curing	" "	" " " "
7-10	Ham & Picnic Curing	Carl Gray	
7-11	Dog Food & Inedible Rendering	Joe Balderston	" "
7-12	Quality Control & Research	Fred Cochran	
7-15	Quality Control & Research	Fred Cochran	
7-16	Beef Department	Sam Davis Hal Helchen Tom Points George Simmons	
7-17	Sales	Roy Hadicke - Sales Route	
7-18	Shipping Dept.	Days - Walt David Nights - Bill Endorf	
7-19	Provisions Dept.	Karl Faidley Frank Wilson	

MR. NAUMANN: Thank you, Davie.

The chairman finds himself in a rather peculiar position in that he is on the program himself. I will try to make the report fairl brief, as I give you the results of this survey of college meats course which many of you have had the opportunity to become familiar with.

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SURVEY OF COLLEGE MEAT COURSES

H. D. NAUMANN

UNIVERSITY OF MISSOURI

The proceedings of early Reciprocal Meat Conferences bear mute evidence that the teaching of meats courses commanded a substantial portion of the confreres' time. The conference time devoted to teaching the last few years has been reduced markedly from the earlier meetings. The early spurt of teaching activity yielded a good deal of information on the foremat of meat teaching in our colleges and universities. We spent a good deal of time discussing teaching methods, and in 1952 the Teaching Committee recommended a syllabus of a basic meats course.

After a period of relative inactivity in this particular area, it was decided this year that we should take stock of the situation by conducting another survey on the teaching of meats courses. We also wished to determine the extent of the use that had been made of the syllabus, and to verify, if possible, some personal convictions concerning the adequacy of the textbooks that we have at our disposal.

I should like to move through the survey now and to give you the reactions as they came in. I might say that we had 42 respondents to this survey.

The first question was "Does your institution offer instruction in meats at the undergraduate level?" Thirty-six of the 42 said yes, or 85 per cent of the institutions responding offer meats at the undergraduate level. In contrast, at the graduate level we had only 24 institutions. A little over 50 per cent of them indicated that they are offering meats at the graduate level.

"How many courses do you offer?" This question is rather difficult to summarize in the fashion in which we asked the question. We had an average of 3½ courses per school offering meats courses. We had a high of 10 courses in one institution devoted to meats and a low in two or three instances of one course devoted to meats.

"How many are annually enrolled in meats courses?" revealed some statistics which are fairly interesting to me. I will give you the range. Roughly from 3400 to 3600 students are enrolled in meats courses in the institutions that replied to this questionnaire. Two or three schools indicated that they only had about 10 students taking the meats courses. One notable institution indicated that they give meat instruction to from 800 to 900 students per year. The next closest institution, in so far as maximum numbers were concerned, was 350 a year.

"Do you have separate meat courses for students majoring in home economics?" Sixteen institutions said yes. That is 40-some odd per cent.

For home economics and veterinary medicine, we only had three institutions offering courses specifically for those students.

Food technology, two institutions.

"What textbooks do you use for the courses listed in answer to question No. 2?" which was "What courses do you offer?" Sixteen courses were listed as having no textbooks. They came from six different colleges. Some of these institutions indicated that in at least three courses that the offered they did not have textbooks for their use. In one instance there were four courses indicated with no textbooks, but it happened to be a speci problems course in one instance, and I felt that it was not exactly justifie to criticize our textbook situation, because special problems normally do no have textbooks.

The text that we found most prominently used was Pete Ziegler's, "The Meat We Eat." They ranged from there down to including pamphlets and biochemistry books.

This question was loaded. "Do the textbooks adequately cover the material included in your courses? Twenty per cent of the people said yes.

The question was raised, "Do you make use of the syllabus for the basic meats course," which I mentioned previously? Over half of our people do make some use of it.

"Would a syllabus for other meat courses be useful to you?" Over three-fourths of the people said yes, 77 per cent, to be exact.

"Do you offer a suggested course of study to students majoring in the meats aspect of the animal industry or animal science?" Forty per cent said yes.

I might say that we received nine mimeographed or typed courses of study which are made available to the students to follow in pursuing the specific major, we will use that word in quotes, in their undergraduate study One institution has a suggested course of study printed for their graduate students.

These are the results of the survey. I should like to share some of the comments with you. We gave you an opportunity to unburden yourselves.

There was indication that several people would like to have an advanced course outlined, and specifically they mentioned the title Meat Technology. I might parenthetically insert that I understand the AMIF is preparing a textbook which will be available some time in the future. I heard yesterday it will be next year. It will include subject matter that we would normally expect to find in a course in what I choose to call Meat Technology.

There were a couple of specific requests for a course outline deali with a home economics course. These institutions do not offer a home economi course, but are anticipating offering one.

One rather astute member present here in the conference offered this suggestion. He prefaced it with the suggestion that none of the textboo are adequate. Facetiously or not, he said that we could use a book from each committee member. I think he was a little facetious.

Now a few personal convictions of my own. I will unburden myself here.

Our texts, as indicated by this survey, would seem to be inadequate for the purposes they are being used. I don't think that we are trying to crucify any of our texts. We are just trying to point out that they are not entirely adequate.

A second personal conviction of mine is that this syllabus that we have available has served a purpose, it appears, and to a certain extent in setting the basic pattern around which our first course in meats is taught. We deviate from it certainly, depending upon the need that we have at our institution. The main ingredients are there. I should think that a similar syllabus would be useful for more advanced courses.

It is quite often difficult to tell what a student has had, if he transfers from one institution to another, by looking at the course title or, for that matter, by looking at the explanation of the particular course in the catalog offered by the institution from which he came. Much as our basic syllabus does now, a syllabus on the advanced courses would serve as a guide and help us quite a bit in interpreting the covering of subject matter that a student might have had in another institution. It would also help us to see where we are in respect to other institutions.

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MR. NAUMANN: Now I should like to introduce Bob Van Stavern who is going to lead the discussion as we move along.

MR. VAN STAVERN: No doubt many words can be said on behalf of teaching. Undoubtedly too many words are said and called teaching that really do not apply. In the interest of time and in keeping with the theme of this conference that we are always on time, we are going to cut short some of these words, and challenge each of you to think seriously about your teaching. Too often in a group of this kind we get together and we discuss research and the results of our research and perhaps let the teaching side of our work be a little slighted.

I would hope that as this conference continues to grow the Teaching Committee will continue to be in the forefront as the group assembles.

In referring to the papers that were presented, I understand there are a couple of gentlemen in our audience who have had experience with this cooperative education. Is that right, Mr. Mackintosh?

MR. MACKINTOSH: Yes.

MR. VAN STAVERN: Perhaps it would be appropriate if we would call on those two gentlemen to give us brief descriptions of their experiences.

Is Harold Tuma present? Harold, you have had or currently are having some experience in cooperative education. I wonder if you would have a few words as to your impressions.

MR. HAROLD TUMA: First I have spent one week in this course; so I am just barely getting started. You have my outline there, the on four-week program. As I told Davie, there is only one thing wrong with that program and that is it is too short.

I feel that for a person who has not had any practical experience in a packing plant, this is a grand opportunity to become familiar with their operations, and I think that for every person who is in the meats field and does not have the opportunity it just can't be beat.

MR. VAN STAVERN: Thank you, Harold.

Jack Gesler, you have had some experiences along this line.

MR. JACK GESLER: Yes, you also have my outline there, the second one. I spent eight weeks at Maurer-Neuer.

Davie mentioned the fact that he has trouble selling the students to industry. I have trouble selling industry to my students. Well, of course, I am just getting started on the West Coast in meats, and it is quite a problem to break in and convince them that we have something for industry.

I am presently attempting to set up a course similar to this. I am working with three packers in the L. A. area. They appear to be very cooperative, and so I hope that I can get a similar type thing going. I am very much convinced that this is an ideal course. I benefite very greatly by it. For example, in the smoking end of meat processing, I worked with a man who had been in it a little over 25 years. He had worked 15 years for Cudahy doing nothing but managing the smoked end of their meat processing. I think if you go about it in the right way you can get tremendous help from men such as he.

I would be very happy to discuss it with any of you who have questions about setting up a course such as this.

MR. VAN STAVERN: Thank you, Jack.

Are there questions from the rest of the members directed to either one of the speakers concerning the report of the Teaching Committ

MR. WELLINGTON: In visiting with some of the members I find that not all of them have copies of the syllabus that was published. Ar copies still available, and if so, to whom do we write for them?

MR. NAUMANN: I have a copy. Generous souls that we are at Missouri, we will furnish additional copies to anybody who requests them. This came out in the survey. One or two people said, "I have not seen the syllabus to which you refer." In general they were people who were departmental chairmen or in institutions where meats courses were just beginning, and you can see why they didn't have them available.

MR. VAN STAVERN: Are there other questions?

MR. HECK: Davie, is there any pay compensation for working in these plants? Any tuition pay or demonstration pay?

MR. MACKINTOSH: The tuition is the same as if the course was taken in residence. The students register before going down. Some time the registration is before the beginning of the semester, so that it has to be taken care of in advance or in some other way, but they register on the campus and pay their fees. There is no compensation. I hope that some day our packer friends might feel it has sufficient merit and would offer some sort of compensation as indicative of their interest as has been done in some other cases but as yet that has not materialized.

Frankly, it is an expensive two credit or four credit course, as the case may be but, after all, we usually pay high for that which is good.

MR. HECK: I should like to say along this same line, we had a student this past year who worked for a packing plant in Iowa. He was paid for his services. Then he came back and graduated this spring, and he spent the summer in Milwaukee, I believe it was, working for this plant.

We have another student who worked last year in an Arkansas plant, and he was paid through the summer, with view of going to work for this company after he was finished.

There are those opportunities.

I was wondering if the training would be better -- I am sure it would be in your course-- than it would be working for the plant for compensation, because you wouldn't be delegated to one division and sidetracked from all the other plant operations.

MR. MACKINTOSH: We have had the good fortune to have two or three students participate in the summer employment of which I think very highly. It is highly desirable. I wish we had it more often. In this case, however, it is supposed to provide one college credit, and, too, it presumably fits into the preparation that the student has had before going down there. In other words, when he gets down there and goes into the curing room he is supposed to know what the ingredients are and the approximate percentages being used and not just bawl out and say, "What the hell are you using?"

MR. MULLINS: One question to Davie with regard to the prerequisites for this course. You mentioned the preparation of the student. What prerequisites are required for the course, Davie?

MR. MACKINTOSH: The prerequisites with us are the two elementary courses and the course known as Meat Practicums. Those are the prerequisites. The Practicums is a course in which we have what you could call the advanced meats, if you like. It is related primarily to animal evaluation and study of those carcasses clear down to the package meats of various types.

MR. VAN STAVERN: If it were not time to recess for lunch, I am sure that we could carry this discussion on for quite a while and get outselves really off schedule; so at the risk of getting in bad with our conference chairman, we will end the discussion on this note.

MR. NAUMANN: Thank you, Bob.

Now I will turn it over to you, Vern.

CHAIRMAN CAHILL: Thanks very much to the Teaching Committee. (Applause) The applause is very much deserved.

(Following announcements, the meeting recessed at 12:00 o'clock.)

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TUESDAY AFTERNOON SESSION

JUNE 17, 1958

The meeting convened at 1:00 o'clock, Chairman Cahill presiding.

CHAIRMAN CAHILL: This afternoon's program, as you will note, includes to major fields, that of the Pork Carcass Evaluation Committee and the Beef Carcass Evaluation Committee. The Executive Committee felt that those are rather fundamental areas in which we must have production and evaluation of the products before any of the other committees can satisfactorily function. We held these for a unit in this last half day of our conference.

In thinking of this Pork Carcass Evaluation work with Chairman Aunan it was suspected that the United States is copying some ideas from our neighbors to the north, and fortunately we have a man in our midst who can speak firsthand of their program. We were also wondering what folks across the ocean have been doing, and again there was someone very closely allied with this conference who could bring us firsthand information.

And perhaps we ought also to think about what we are doing ourselves. Many states have now entered into the swine evaluation station program, and we have a member of the conference who has kept up to date very well on the progress of those stations.

We sort of twisted the arms of Woodie to take this first part of the program into his own hands. I wonder, Woodie, would you like to share your ideas with us today.

MR. W. J. AUNAN: Thank you, Vern and Members of the Conference.

I should like to say first that these are ideas I don't think we can say that they are all based upon facts. Some of them have to be in the category of opinions.

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THE ROLE OF SWINE EVALUATION STATIONS

W. J. AUNAN

UNIVERSITY OF MINNESOTA

There is no question as to the great challenge that is facing the swine producer in maintaining and expanding his market for pork. To review briefly it is accepted that the consumption rate on pork in this country has been down in recent years. Three factors stand out as being responsible for the reduction in pork consumption:

1. There has been an increase in consumer preference for beef perhaps in line with what is expected during post-war prosperity periods.

2. The increase in consumption of poultry. Certainly this would be an expected occurrence in view of the increased efficiency in producing birds. Breeding, feeding, and improved methods of merchandizing account for a major portion of the lowered cost in poultry production.

3. The factor that we stress possibly more so than the other two factor is the consumer wants less fat in his pork cuts. Much discussion ha centered on this question of the producer increasing the number of meat-type hogs. One of the results of this problem has been the development of swine-testing stations. I would not like to limit this discussion to the role of the swine-testing stations because they ar not the only agency involved in the challenge concerned with getting pork back on the table. Involved in this task are: the researchers in the field of meats, the animal breeders, the nutritionists, the meat packers, the marketing organizations, the retailers, and the education forces concerned with the consumer.

In the field of meats research we recognize that much has been done in the development of tools which are useful in swine carcass evaluation. Whole carcasses have been physically separated into the various tissues and these related to linear measurements for purposes of estimating fat and lean tissue content of swine carcasses. Along with these chemical analysis of swi carcasses has been employed in validating the effectiveness of these measurements as indices of fatness and leanness in swine carcasses. Estimation of carcass fatness has been demonstrated by the use of specific gravity and density determinations. Sampling swine carcasses by the use of a coring device or through the use of one of the primal cuts have been and are used as estimates of carcass fatness and leanness. It seems a great part of the challenge has been met by researchers in carcass evaluation techniques. Work is still being conducted towards finding methods which may be more effective in predicitng what a swine carcass contains.

The swine-testing stations are employing these methods in their swine carcass evaluation programs. In addition, on the hoof measurements are taken for backfat thickness through the use of a probe. Along with these measurements feed efficiency and gaining ability are considered and records kept to facilitate culling potential seedstock which does not qualify as meat-type hogs.

Swine-testing stations have been developed in most of the corn belt states. In some states demands for testing have exceeded the capacity of the existing facilities. As a result, provate individuals have adapted their facilities to swine testing to accommodate the increases in demand for testing breeding stock. From these developments in swine testing there will result an increase in the number of meat-type hogs.

One may, however, question the time factor involved in this program of increasing the number of meat type hogs. Estimates on the percentage of meat type hogs going to slaughter range from 12 to 25 per cent by large packers in certain areas. If these estimates represent the picture, there remains a great challenge to the hog producer. It would seem logical that more information is necessary on these estimates so that rate of improvement can be measured. Involved in the issue concerning the time factor is how long will it take to improve the existing breeds of swine to the point of satisfactory pork production. New breeds have been developed and within relatively short periods of time through the use of crossbred foundation stock. Continued investigation with these methods is necessary to permit the possible development of a combination of genetic material which will produce pork that is in line with consumer demands. Many of these new breeds are undergoing tests with swine testing stations. Records obtained from these stations can render valuable assistance in evaluating which lines will be superior in meat-type hog production.

There is no need to emphasize the challenge with respect to the swine nutritionist. Much work is being done and has been done in providing rations which will be both economical and conducive towards increasing meat-type hog production.

With marketing agencies we have varying degrees of effort being exercised to encourage and stimulate meat-type hog production. In some areas there has developed an incentive program which means the farmer is paid for what he produces. This is seen in the spread of prices that are being paid for hogs within the same weight bracket. New systems of grading and sorting have been developed that take into consideration the major factors that make up the actual value of the animal. The present United States standards for barrows and gilts are based upon carcass measurements. There is room to consider the limiting factors of the present grade standards for hogs in relation to the prices quoted for hogs. In the live grade standards one factor is not included and is important to the buyer. This factor is dressing percentage. To illustrate this point more clearly one may say that the variation in dressing percentage allows hogs with a potential of producing U. S. No. 2 carcasses of being worth as much as hogs with a potential for producing U. S. No 1 carcasses. One cannot expect a wide variation in prices for hogs when the factor fill in dressing percentage is not included in the live standards. A packer buyer is interested in obtaining hogs with a high percentage of liveweight in the form of lean cuts. For example: Hog A with a U. S. No. 1 carcass potential of 50 per cent--four lean cuts and 68 per cent dressing percentage will yield 34 per cent of its live weight in the form of the four lean cuts. Hog B with a U. S. No. 2 carcass potential of 48 per cent--four lean cuts and 70 per cent dressing percentage will yield 34.5 per cent of its live weight in the form of the four lean cuts. It then becomes apparent that variations in price offerings cannot be as wide as some are inclined to assume with their interpretations based only on carcass value. Perhaps consideration should be given to exploring the possibility of changing the standards for live grades. A straight forward numerical system based on the percentage of four lean cuts may reflect more equitably the actual value of the hogs. In as much as 95 per cent of the hogs are sold on a liveweight basis there is reason to assume that the grade standards as in use at the present time allow a great deal of variation.

A factor in such a set of standards that employs percentage of four lean cuts in relation to liveweight is the fill a hog has a slaughter. A higher price per hundredweight should automatically be incurred when a hog has been restricted in feed intake prior to slaughter. This possibly could encourage less feeding prior to selling and result in a substantial saving to the industry.

The challenge with packers in participating in increasing meat-type hogs is just as great as with other agencies in the movement of pork to the table. A critical analysis of their buying operation is desirable so that price offerings for hogs will be more reflective of the actual value. Some packers have inaugurated new systems of buying hogs which will give an incentive towards increased meat-type hog production. Packers through the demands of the consumer have initiated cutting and extra trimming of pork cuts to lessen the amount of fat which the consumer hesitates to buy. One problem which perhaps is a factor that needs more attention is in educating the consumer that higher prices for pork are expected with increased trim of fat. S has a degree of resistance that seems to be traditional. For years the meat counter has been her bargaining place and she seems to enjoy exercising her judgment in buying meats. Education in this area is needed and will have to be accomplished to overcome this difficulty.

Because of time limitations, nothing has been mentioned concerning the quality of pork in relation to such factors as eating quality, color, firmness, and methods of meat cookery. These factors are part of the problem and work in this direction has begun but is not included in the testing of hogs at swine testing centers.

The role of swine-testing stations may be looked upon as an example and pattern for the commercial hog producer to follow. The capacity for test ing all of the seed-stock necessary in market hog production is not economically feasible. In the state of Minnesota it would require facilities to tes 25,000 boars and if only a third of them qualified there would be considerabl time and effort spent before adequate numbers would be available. The evolution of changing swine type rests in the hands of the farmer who is a produce of seed stock. A great part of the challenge rests with him. We do have some who are more aware of this problem than others and will cope with the problem. They are the ones who will survive the ordeals of competition. Thi competition will come from large companies who will govern the entire program through sound methods of selection and breeding and bring about the changes i swine types which are so necessary in putting pork consumption rates at a higher level. What has been good for the poultry industry may be the realization of the swine industry unless the role of the swine-testing stations is practiced by the individual hog breeder and producer.

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MR. AUNAN: The next speaker, who is going to discuss the meat type hog program in Canada, is Bob Ingram. I wrote to him some time ago when the program was being scrutinized and developed at the executive level and he agreed to participate and to give us the picture of the meat type hog program in Canada. I am sure that most of you have met Bob, and this is our chance to hear how the picture looks in Canada.

Bob.

MR. R. H. INGRAM: Thank you, Woodie.

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THE MEAT TYPE HOG PROGRAM IN CANADA

R. H. INGRAM

ONTARIO AGRICULTURAL COLLEGE

My assignment of reviewing the meat type hog program in Canada has been made much easier by the recent publication of the U. S. D. A. Marketing Research Report number 227. This is the report of a commission of seven live stock specialists including our associates, Dan Brady and Lowell Strong, who came to Canada last year, 1957, to study our swine program. This is an excellent report which will be very useful in the live stock industry. In planning my paper for to-day it seemed appropriate to consider it as a supplement to this Marketing Research Report. I will attempt to cover briefly the mechanics of our swine program, some criticisms and current efforts to improve the program. I hope that any points that I miss may be brought out in the discussion.

Canada owes a great debt to Denmark for getting her started on a carcass improvement program. It was the threat that the high quality Danish bacon imposed on Canada's export market in Britain that resulted in the decision to institute voluntary live grading of Canadian hogs in 1922. This evolved through compulsory live grading to carcass grading which became compulsory in 1940 for all hogs marketed. Canada lost the British export market in 1951 due to currency differences and at present only very small amounts of pork products are exported, some to the United States. Incidentally, the "Canadian Style" back bacon that is sold in U. S. stores has never been to Canada.

The carcass grading system has developed progressively with periodi revisions to keep it in line with modern practice. Criticisms are not uncommon but many of them may be expressions of rebellion against regulation. A brief summary of what happens to a market hog may be useful to explain the carcass grading system.

The ration that a market hog receives in Canada is usually slightly lower in energy and slightly higher in fibre than the majority of rations in the U. S. based on corn. Also, it has been found that restricting the energy intake during the last six to eight weeks before marketing, either by dilution or by restricted feeding will produce a leaner carcass. The question that the producer asks is "will this pay?" This question is not easy to answer since the hog must be fed for a longer period. The producer must decide what is the most desirable market weight and feeding method for his particula strain of swine to produce the most top grade carcasses.

The market hog is marked on its side with the producer's tatoo numb for permanent identification of the carcass. Agreement as to the price to be paid, with differentials according to carcass grade, is made in advance with the buyer at the packing plant.

When the hog has been killed, dressed and inspected, the hot carcass is weighed and graded by an official grader. The tatoo number, weight, grade and criticism of the carcass are recorded on a double ticket attached to the carcass. One half of the ticket remains with the carcass and the other half is separated as the record for payment at the previously agreed price.

The producer receives a check from the packing plant, an official grade certificate and a premium warrant if the carcass was in either of the two top grades. The premium of $2.00 for a grade "A" or $1.00 for a grade "B1" is paid by the Dominion government in addition to the price per pound paid by the packer.

Mimeographs of the grade standards have been distributed. The grade standards are based on weight, length, thickness of back fat at shoulder and loin and a descriptive definition which includes balance, thickness and width of belly, fullness and shape of ham, colour and firmness of fat, smoothness of skin and freedom from dark hair roots or pigment.

Last year, 1957, of the 5½ million hogs marketed, 29% were grade "A", 42% were grade "B 1" and 10% were grade "C". Therefore, the government paid out approximately $3,000,000.00 in $2.00 premiums for grade "A" and $2,000,000.00 in $1.00 premiums for grade "B 1".

The grade standards have always been and probably always will be the subject of argument. It seems, by comparison, that one pound difference in weight may separate two grades. In practice, however, other factors are usually present which would determine the decision between grades at these weight ranges.

The mimeograph of the proposed changes in standards is an indication of the trend toward lighter weight, leaner hogs. The workers involved in the swine program are continually striving to improve the standards. The proposed changes are being applied to a percentage of all hogs graded on a trial basis in order to study their effect on the swine industry.

The proposed changes would extend weight ranges of the grades "A", "B 2" and "B 3" to five pounds lighter weights. The back fat tolerances of the higher grades would be one-quarter inch less. This trend is the result of the preference of the packers for lighter, leaner hogs which they can break down more profitably into trimmed, lean cuts. It is thought that the proposed changes will cause more hogs to be graded "A" and "C" and less "B 1".

The proposed changes will favour the Eastern producer who conserves expensive grain by feeding adequate protein supplements. In the West, fatter hogs are usually the result of feeding cheap surplus grain with a longer feeding period as a substitute for protein supplements.

When we judge and cut hog carcasses at the meat laboratory we often place a "B 1" carcass over an "A" because of lack of firmness of the "A" carcass and its cuts. This is not "soft pork" however, as it is known in the United States. In fact we have difficulty finding really soft carcasses to show our students. This lack of firmness of under-finished grade "A" carcasses is apparently of much less importance to packers than the amount of lean and length of the carcass. But we do see some side bacon that is too thin and lean to be attractive.

The carcass grades are not carried over to the lean cuts. It is said that packer grades are applied to bacon but I have yet to see evidence of it in the stores. My own procedure for the selection of bacon at the retail counter is to attempt to pull back the piece of cardboard that hides the face of the strip of bacon, without breaking the cellophane, in order to see the distribution of fat and lean. This practice was recently facilitated by a government order prohibiting the use of red cellophane.

Most Canadian swine are of the Yorkshire breed due to the severity of the grade standards in regard to dark hair roots and pigment. This makes it unprofitable to keep the dark colored breeds.

A newly developed white breed, the Lacombe and imported Swedish Landrace are being used to a limited extent for crossing with the Yorkshire. At the College we have a herd of Large Whites or English Yorkshires which are eligible for registration as Canadian Yorkshires. The principle of crossing for hybrid vigour has been advocated by some groups in Canada but is not generally accepted for practical application.

A Record of Performance testing program on a national scale has done much for the improvement of breeding stock. This program was begun a number of years before carcass grading of hogs was made compulsory. There are seven test stations across Canada where pigs are fed under uniform conditions.

Purebred sows and boars may be tested by the Record of Performance of their litters and qualified for Advanced Registry under a point system for scoring the carcasses. Four pigs from a minimum of eight in a litter are sent to a test station in order to begin test on the day when the group of four pigs weighs 200 pounds. The standard A. R. ration is listed on the mimeograph

The hogs are marketed individually at a weight predicted to yield a carcass weight of 150 pounds. The carcass is measured and cut by a standard method and scored on the basis of length of carcass, back fat measurements, balance of ham, middle and shoulder and grade of belly. The score for belly grade is determined by comparison with a series of standard pictures (illustrated). A sow is qualified for Advanced Registry by a score of 75 points. A boar is qualified by three litters which score 75 points.

In addition, pigs submitted for testing must be true to type for the breed. This type requirement and the score for balance may eventually be dropped as they are considered by some people to be unnecessary in the program

An Annual Report (illustrated) is prepared, listing the detailed score for all sows and boars tested under Record Performance and qualified for Advanced Registry. This information is very useful for planning purchases of breeding stock.

I would like to emphasize that satisfaction with the meat type hog program in Canada is not complete. Recent evidence of this is the formation of a producers' co-operative in one province, Ontario, which now controls the marketing of hogs in this province under the authority of co-operative marketing legislation. This marketing system has not been operating long enough for a factual appraisal of its worth.

At the risk of appearing mercenary, I would like to suggest that Canada might contribute to the meat type hog program in the United States by supplying Yorkshire breeding stock. We see some of our best Yorkshires being shipped South each year and our breeders appreciate the possibilities of this market.

One must concede, however, that it probably would not pay a producer to obtain meat type breeding stock and adopt known methods of feeding and management for the production of very lean hogs under the present methods of pricing hogs in the United States. The first step would seem to be the provision of incentives such as increased price differentials and premiums. It will be necessary to show the packers how lean hogs make more profit and the experience of their Canadian associates may be useful for this purpose.

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PROPOSED CHANGES IN STANDARDS FOR GRADES OF HOG CARCASSES

	Present Grades				Proposed Grades			
	Wt.	Length	Sh.Fat	Loin Fat	Wt.	Length	Sh.Fat	Loin Fat
A	140-170	29	2	1½	135-170	29	1¾-2	1¼ - 1½
B2	125-134	27	2	1½	120-134	27	1¾	1¼
B1	135-175	28-	2-2¾	1½ - 2	135-170	28-29	2-2½	1½ - 1¾
B3	176-185	30	2¾	2¼	171-180	30	2½	2
C	120-185	-	3¼	2½	120-180	Nil		
D	120-185				all wts.	culls		
Lts	Under 120				Under 120			
Hvys	186 & up				181-195			
XHvy	196 & up				196 & up			
P.I.	....				Place all P.I. in D grade			
R	....				R			

Standards for Grades of Hog Carcasses

(a) Weight ranges and carcass measurements.

(i)

Grade "A"	Class 1
Weight	140 to 170 pounds
Minimum Length	29 inches
Maximum shoulder fat	2 "
Maximum Loin fat	1½ "

(ii)

Grade "B"	Class 1	Class 2	Class 3
Weight	135 pounds or over but not over 175 pounds	125 pounds or over but under 135 pounds	Over 175 pounds but not over 185 pounds
Minimum Length	28 to 29 inches acc. to weight	27 inches	30 inches
Maximum Shoulder Fat	2 to 2¾ inches acc. to weight	2 inches	2¾ inches
Maximum Loin Fat	1½ to 2 inches acc. to weight	1½ inches	2¼ inches

(iii)

Grade "C"	
Weight	120 pounds or over but not over 185 pounds
Maximum Shoulder Fat according to weight	2¼ to 3¼ inches
Maximum Loin Fat according to weight	

(iv) Grade "D"
Weight - 120 pounds or over but not over 185 pounds, and underfinished, rough, soft or oily carcasses of any weight.

(v) Lights - weight under 120 pounds.

(vi) Heavies - weight over 185 pounds but not over 195 pounds.

(vii) Extra Heavies - weight over 195 pounds.

(viii) Physical Injury - all weights.

(ix) Ridglings - all weights.

(x) Stags - all weights.

(xi) Sows - Class 1 - all weights.
Sows - Class 2 - all weights.

(xii) Rejected or Condemned Carcasses shall be graded in accordance with the above grades, and in addition shall be shown separated on the Grading Certificate as Rejected or Condemned.

(b) Grade Standards

(i) Grade "A"

Grade "A" carcasses shall be of best quality.
Shoulder - Shall be balanced in weight in relation to the ham.
Belly - Thick and of even width throughout, with full flank.
Ham - Full fleshed, evenly covered with fat of good shape.
Back - Fat firm and of even thickness within variation allowed.
Quality - Fat firm and white with proper balance of fleshing and fat in carcass throughout. Skin shall be smooth and show no marked evidence of dark hair roots or pigment.

(ii) Grade "B"

Grade "B" carcasses may vary from Grade "A" in any weight class as follows:

(a) Class 1 and 3

Shoulder - Slightly heavy or slightly fat.
Belly - Slightly thin or fat or wide.
Ham - A little thin or slightly fat.
Back - Fat slightly uneven on back or slightly deficient, or a little overfat throughout the carcass.
Quality - Fat a little soft or somewhat out of balance between lean or fat.

(b) Class 2

Shoulder - Slightly heavy.
Belly - Thin or uneven.
Ham - A little thin.
Back - Fat slightly uneven on back or slightly deficient.
Quality - Fat a little soft.

(iii) Grade "C"

Grade "C" carcasses shall be well finished and of good quality of fleshing, but may vary from Grade "B" by including a greater degree of fat to lean, softness and unevenness of fat, heaviness of shoulder, and roundness of rib.

(iv) Grade "D"

Grade "D" carcasses may contain overfat, unfinished, rough, soft or oily carcasses.

(v) Lights

The grade Lights shall include all carcasses of reasonable finish and quality within the prescribed weights, but shall not include thin or underfinished carcasses.

(vi) Heavies

The grade Heavies shall include all carcasses of reasonable finish and quality within the prescribed weights, but shall not include thin or underfinished carcasses.

(vii) Extra Heavies

The grade Extra Heavies shall include all carcasses of reasonable finish and quality within the prescribed weights, but shall not include thin or underfinished carcasses.

(viii) Physical Injury

Carcasses that have suffered serious physical damage shall be graded Physical Injury.

(ix) Ridglings

Carcasses from ridgling pigs shall be graded Ridglings.

(x) Stags

Carcasses from boars that have been castrated and healed shall be graded Stags.

(xi) Sows

Carcasses of females that have raised one or more litters shall be graded Sows as follows:

(a) Class 1: Carcasses of good fleshing throughout.
(b) Class 2: Carcasses that are overly fat or very thin.

(xii) Rejected or Condemned

Carcasses that are rejected or condemned by the Veterinary Inspector on account of disease shall be graded Rejected or Condemned.

(c) Method of Measurement

(i) Measurement for the length of the carcass shall be taken from the front edge of the first rib to the inside of the aitch bone.

(ii) Fat measurements shall be taken as follows:

Maximum shoulder - At the point of maximum fat thickness on the shoulder, except for any small fat infiltration into the lean.
Maximum loin - At the point of maximum fat thickness on the loin between the last rib and the tail.

(iii) Carcass weights shall be "Warm Weights", including the head, leaf-lard, the tongue, kidneys, tenderloins, tail, backbone and feet; and

(iv) Whip marks, scratches, and bruises shall not be a factor in determining grade except those graded as serious physical damage.

THE A. R. SWINE RATION

This "pattern" ration is shown in this display because it is being used in the seven (7) Advanced Registry Stations across Canada. The present formula was adopted in 1952 on the recommendation of the Advanced Registry Feed Board. Every attempt is made to standardize the ingredients used by the Test Station suppliers to produce as uniform a ration as possible. The present ration is giving very satisfactory results. The ingredients in the Advanced Registry ration are as follows:

Grower	Basal Grains 85% plus Supplement 15%
Finisher	Basal Grains 92% plus Supplement 8%

Basal Grains *		Supplement *	
Barley	50%	Soybean Oil Meal	60%
Oats	30%	Meat Scrap	20%
Wheat	20%	Fishmeal	10%
		Ground Limestone	5%
		Iodized Salt	5%

To each ton of grower is added:

Vitamin A	2,000,000 I.U.
Vitamin D	200,000 I.U.
Vitamin B_{12}	9 Milligrams
Antibiotic ** (in suitable carriers)	9 Grams

There are no additions to the finisher but if this ration is fed to stock intended for breeding the Vitamins A and D should be continued.

* The minimum standards for ingredients are as follows:

Barley No. 2 Feed	Soybean Oil Meal	42% Protein
Oats No. 3 C. W.	Meat Scrap	45% "
Wheat No. 5 Northern	Fishmeal	60% "
	Ground Limestone	95% Calcium Carbonate

** The antibiotic specified is designated as a broad spectrum antibiotic, that is either Aureomycin or Terramycin.

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CHAIRMAN CAHILL: The Chairman is always on the spot. As you see, Woodie just passed the ball across the podium. He gave me the task of introducing a man who really needs no introduction to this group. But I think a few comments can be made which might serve as a challenge to every young person in this audience, and I learned yesterday that there is no one here except young persons.

Your program indicates that this next speaker is Scretary and Manager of the Producers Livestock Association, which tells us immediately that he is quite involved in the marketing of swine. This same organization which he heads is also reaching out into the merchandising phase of our meats program. They have gone beyond getting their feet wet; they are really in the swim and doing a good job of seeing what the retail merchandiser and consumer think of some of this improved pork. In all of this he has not forgotten about production, because he is very definitely involved in producing some hogs.

In addition, he is quite a supporter of groups such as this. As a member of the board of trustees of Ohio State University he has an appreciation of what is involved in meats teaching and research, and he was very instrumental, in fact, the wheel horse in getting the swine evaluation station constructed and the program moving there at Ohio State.

In addition you have seen him in past years and if you attend the meetings of the National Live Stock and Meat Board again this year you will see him sitting as a member of that Board.

I believe we can consider this neither horizontal nor vertical integration, but rather just a well rounded area of appraisal, and in order to make the ability a little more complete, Mr. Brunner, who is in charge of the station at Columbus, made a tour on the European continent this past year and spent several weeks studying the improvement programs in that area. I believe the comment has already been made this afternoon that many of the roads in swine improvement lead back to Denmark; therefore, we have asked Mr. Ketner to come and share some of his ideas with us this afternoon.

Mr. Ketner. (Applause)

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THE MEAT-TYPE HOG PROGRAM IN DENMARK

F. G. KETNER

PRODUCERS LIVESTOCK ASSOCIATION

I am going to beg the indulgence of you people while I read some remarks, a thing that I much dislike doing, but reasons beyond my control prevented preparation and handling of this assignment without a manuscript.

At the outset I want to congratulate the participants in the Reciprocal Meat Conference for the excellent contributions you have made to the livestock and meat industry and to a better understanding of the use of meat.

As a director of and past chairman of the Board, I am most appreciative and grateful for your fine cooperation, and I know that other members and the administrative officers of the Board fully share that opinion.

I should like to suggest that your knowledge, your opportunities for research, your close working relationships among yourselves, your potentials for improving and standardizing carcasses and cuts, and your many other acceptable contributions enable you to give invaluable guidance to the livestock and meat industry. If you individually and collectively accept the challenge and fully activate your knowledge, you will aid in providing the best solution for a major segment of the so-called agricultural surplus problem. Even more important, you will assure better nutrition for 165 million Americans.

We must all take a more searching look at the livestock and meat industry and the impacts of the changing times affecting it, like Rastus who went to see his girl friend, When she appeared in a new sack dress, Rastus said, "Lisa, is you in style or is we in trouble?" (Laughter)

I think the implication is clear.

May I preface my remarks on the topic you assigned me, "The Meat Type Hog Program in Denmark", by explaining briefly the why, the who, and the what of our European study trip last year, including Denmark.

Producers Livestock Association, as most of you know, I think, has activated and conducted a meat type hog improvement program as a basic and integral part of its broad marketing and integration program from producer to consumer. Basically, this system includes near-home livestock markets, centralized sale of hogs received at all of the local markets, standardized grades of hogs, including trademarked "Tend-R-Leen" meat hogs; part ownership and continual business transactions with a cooperative packing plant and a chain of supermarkets. These supermarkets, by the way, sell a substantial volume of imported meats in cans which comes from countries we visited. Why does this farmers' cooperative distribute meat in cans imported from other countries? Because the consumer wants it; because she requests it, for it is lean, tender, and uniform in quality; and because it is a good profit item. The desire of Mrs. American Housewife for tender, lean pork uniformly well processed is self evident. Twelve years ago Producers Livestock Association recognized this fact and decided to promote the production of meat type hogs.

For a number of years Producers marketing associations of Indiana and of the Cincinnati area marketed hogs through the centralized sales subsidiary of Producers Livestock Association. Later a jointly owned subsidiary, Producers Swine Improvement Association was established by these three associations. Its purpose is to conduct and promote research to improve the production and marketing of meat type hogs. Its funds are derived from a voluntary retainage of 2 cents per hog on the more than 2½ million hogs marketed annually by the three associations.

Our swine improvement association gave financial support and guidanc to development of the swine evaluation station at Ohio State University, and more especially to the station at Purdue University. We maintain a full-time man to help commercial hog producers secure meat-type seed stock from purebred breeders. The association helped to finance a study by Purdue University to evaluate Mrs. Homemaker's preferences for Tend-R-Leen pork. I have here some data from the study, but the complete manuscript has not yet been released.

Producers Swine Improvement Association also has financed a three-year artificial swine insemination study being conducted jointly by the Ohio Agricultural Experiment Station and Ohio State University. We have conducted cutout tests on thousands of hogs at cooperative packing plants and sponsored other research projects as a means of improving the production and marketing of meat hogs. We have selected and trademarked the term Tend-R-Leen for meat-type hogs and pork and pork products meeting the association's standards. Hogs are being marketed under the Tend-R-Leen trademark which will be franchised to slaughters and processors of hogs meeting Tend-R-Leen specifications

The European study trip last summer, financed by Producers Swine Improvement Association, was for the purpose of securing information which would, we believed, accelerate our swine improvement and marketing program.

We selected Mr. Cliff Cox, an economist at Purdue University, and Professor Wilbur Bruner of Ohio State University, to accompany me. Mr. Cox concentrated on the economics involved in production, slaughtering, processing, and exporting of hogs and pork and the translation and evaluation of them in terms relating to the eastern Corn Belt. Professor Bruner sought to evaluate and compare methods of progeny testing and selective breeding, and, of course, to compare hogs, carcasses, and standards used in Europe with those we are using in the eastern Corn Belt.

We made studies in Denmark, Sweden, the Netherlands, France and England. Our trip for this study was timed to accept an official invitation to attend the International Progeny Testing Conference at Copenhagen that was under the sponsorship of the FAO- EAAP. Mr. J. L. Lush, of Iowa State College was also an official participant. Twelve western European countries actually participated in this conference. You likely will be more interested in that conference as a criterion of the developments over there in swime improvements than developments in any one country.

I should say that Denmark was a foremost leader in the conference. However, let me add here that we find that the United Kingdom is very alert, progressing rapidly in the progeny testing work and in the coordination of sales of hogs and pork. If my friend from Canada has any concern about the cooperatives handling large numbers of hogs in Canada, he needs only to go to the mother country and ascertain what the Fat Stock Marketing Cooperative is doing in handling about 80 per cent of all the hogs slaughtered in Great Britain with the assistance and cooperation of the government.

The 67 progeny testing stations in Western Europe represented in this conference have an annual capacity of 30,000 to 36,000 pigs. Nine larger, new stations are under construction and others are planned. Progeny testing is increasing gains; is improving feed conversion; and is developing a program of selective breeding. It is resulting in the production of a meatier, more desirable, and more uniform hog carcasses throughout Western Europe. That is not my opinion alone; it was briefly the summary of the conference.

Probably more important is the fact that the countries are working together, freely exchanging research information, all leading to an international relationship for coordinating their efforts in supplying the European markets, and expanding their invasion of foreign markets, including the United States. The man who is considered the father of the program in Denmark, I shall not mention his name; most of you know him, does not hesitate at all to say that it is their objective, of necessity as they increase swine improvement, to extend their exports to all countries. Denmark is a foremost influential leader in this international program. Sweden, the Netherlands, Poland and England are eying foreign markets, too.

As regards Denmark, the soil is virtually Denmark's only raw material. Its chief asset is its people. They are home and arts loving. They are neighborly and cooperatively-minded, the rural people probably especially so. Only 20 per cent of the 4½ million population are farmers, and they are on 212,000 farms, small farms. One-half of the total number of farms have less than 25 acres, and less than 2 per cent of all the farms are 150 acres or more.

Agricultural products account fot two-thirds of all Danish exports-about $830 million in 1956. Twenty-five per cent of the exports were bacon, pork or pork products, 25 per cent butter, and 8 per cent eggs.

During 1957 Denmark produced about 7,000,000 hogs. They told us that 6,000,000 would be better under present conditions until they can further expand their foreign markets, ours included. At that time we were sending pork and pork products into and were opening up markets in about 40 foreign countries.

The 7,000,000 hogs which they produced in 1956 were slaughtered by 78 bacon factories. Sixty-two of these are cooperatives that slaughter 88 per cent of the hogs. Sixteen private plants slaughter 10 per cent, and small butchers kill 2 per cent. Bacon factories do primarily slaughter and curing of sides for export to Great Britain. That is the Wilshire side. The English bacon is first stitch pumped and held in brine four days, dried four days, then wrapped four to a bundle for shipment to England, where it is dry smoked before being sold. Some cooperative plants do processing and canning, and three cooperative canning factories buy cuts and carcasses from the cooperative bacon factories. They keep each project pretty well on its own bottom over there, and do not subsidize one with another. However, most of the canning i done by private firms.

Since the cooperative bacon factories slaughter 88 per cent of the hogs, they have a most important role in pricing, export policies, standardization of grades and practices and, above all, in the improvement of hogs in which they have borne the sole responsibility.

Pricing and marketing of hogs is different than here. On Thursdays of most weeks the Price Committee of the Federation of Cooperative Bacon factories meets and sets the price that all cooperative bacon factories will pay the following week. Private factories have to pay as much or more to get pigs, and usually more, because the co-ops pay a dividend - a patronage refund - at the end of the year. Some private factories are beginning to do that als

Each pig producer has a number assigned to him which he puts on each pig with an inkless tattoo marker, as he sends it to market. Pigs move direct from the farm to the bacon factory with commercial truckers or factory-provided truckers. The pigs are slaughtered, the carcasses weighed and graded, and the farmers are paid on that basis. Farmers who own and operate their own bacon factories have no reason to want government graders and no occasion to question carcass grades or weights on which they are paid. Those who sell to private firms are said to occasionally voice objection to grades and weights.

Cooperatives and private firms work together on some matters of common interest. They negotiate with government ministries and authorities concerning the hog and pork industry. They work together in setting standards for products and then make tests to determine if standards are being maintained. Testers visit plants at unannounced times to check on quality controls. If any product anywhere, in Great Britain or this country, is found at any time, within reasonable tolerances, to be not of the standard or qualit recommended, it comes back at the expense of the cooperative or private factor which processed it, and in turn sometimes becomes the responsibility of the farmer producer.

We visited an experimental laboratory for bacon factories which was a model of excellence. It is a laboratory that any of you would be pleased to have in your university or experiment station. As an University trustee, it made my mouth water. This I wish you to get. I said to the interpreter, "How did the bacon factories provide this?" He said, "They didn't." I asked, "Who did provide it?" and the answer came back, "Uncle." (Laughter) Then they told me the story.

At the close of World War I there was a fear that Great Britain might be without adequate supplies of pork, if disease should strike in Denmark. So it was suggested that Denmark ought to have adequate funds to build the best disease prevention laboratory that could be provided. Apparently Denmark got it. Now it is operated by the cooperative bacon factories. They underwrite the operating cost and, by the way, a Mr. Jewell, who is a cousin of the Jewells in Minnesota, is the capable director of that laboratory. He comes to this country occasionally. I think he is to come over this summer.

He is a gentleman you would be very interested in meeting, and is fully informed on more than I can possibly tell you.

The Federation of Factories, that is, cooperatives and private, bargain with the 10,000 employees of the 98 plants. The Bacon and Allied Factories Purchase Association buys at wholesale or contracts for the manufacture of equipment needed by all of the factories and processing plants. The Danish Bacon Factories Export Association controls the export of pork and pork products.

Several services are offered by the cooperatives exclusively. The first and most important service is the Central Committee for pig breeding, which controls the three testing stations and the 267 breeding stations which provide the stock or the pigs for the progeny testing.

The cooperatives also own an insurance department which provides maritime, war, fire and accident insurance. They are in control of and operate the Price Committee composed of four managers and two farmers who meet on Thursday, as I have said heretofore, to set the price on pigs for the coming week.

Testing stations in Denmark were started more than 50 years ago by the cooperatives. The older stations were all replaced in 1950 by three large, modern stations, each with a capacity of 400 pigs, each pig penned separately. An average of about 1,200 pigs go through each station each year. Originally breeding stations were established for both Landrace and Large Whites, but now only 2 of the 267 stations are devoted to Large Whites.

Breeding stations or farms are selected on the basis of the interests of the farm operator, his care and management, and the quality of his hogs. The number of breeding stations is not now being increased, but there are many farmers who would like to operate such stations because of the price advantage it gives them. It also is considered a distinct honor and a compensation sometimes exceeding the monetary advantage to be the owner and operator of a breeding station which supplies pigs for a progeny testing station.

These breeding centers are subject to inspection by the Central Committee for Pig Breeding and by an advisor on pig breeding who cooperates with local pig breeding committees. A veterinary inspection is made twice a year and all animals over 8 months of age must pass a tuberculosis test. All animals found to be unsuitable by the Committee or by the veterinary inspector, must be discarded from the herd.

The farmer operating a pig breeding station sends two females and two males for each litter, to the testing station in his area for certification. He is paid the going market price for the pigs, plus transportation costs. Pigs go on test when they weigh approximately 44 pounds and are slaughtered by a bacon factory, when they weigh 200 pounds. They are hand fed three times a day a limited ration of milk, barley, potatoes and hops. Temperature in the testing stations is controlled at approximately 57.2 degrees Fahrenheit.

Pig testing stations are under the general direction of R. N. Thomsen, research officer of the National Research Institute of Animal

Husbandry. The man in charge of each station is known as an assistant leader Two or three laborers are required at each station.

Any profit or loss from operation of the stations accrues to the cooperative bacon factories. In the main, some savings have been affected and have been plowed back into improvements.

Data on all pigs tested is made available immediately to the farmer who produced the pigs, and is published. Test results, of course, serve as a basis for selection to improve breeding herds.

During the time the stations have been in operation, rate of gain has been improved approximately 20 percent and feed cost has been reduced correspondingly. Apparently, no progress in carcass quality was made until about 1926-1927, but since then the quality of Landrace pigs has shown steady improvement. A high degree of uniformity has been attained in length of body, average backfat thickness, and thickness of streak. Proof of progress can be seen in these comparisons:

Year	Length of Body	Ave. Backfat Thickness	Thickness of Streak
1926-27	35.03 in.	1.596 in.	1.204 in.
1955-56	37.08 in.	1.265 in.	1.308 in.

The ideal carcass today carries not more than 1.182 inches of backfat. Carcasses are also scored on hams, shoulders, fullness of meat and bacon type. Loin eye shape and size have been studied since 1954 and also the color of the meat. Breeders are urged to consider this in selecting breeding stock.

The cooperative bacon factories buy boards from the breeding farms and sell them to commercial hog producers. In a year's time they sell about 9,000 boards in this manner and the breeding farms sell an equal number of gilts directly to commercial producers.

In the opinion of our committee, Sweden also is doing an excellent job of hog production and pork marketing, although hogs there are not quite as good as those in Denmark. Denmark, you understand, has thus far declined to allow any hogs to leave the country for breeding purposes. A few have nevertheless gotten to Sweden.

Approximately 75 percent of the hogs in Sweden are Landrace, 25 percent Large Whites. Breeding is concentrated in about 200 breeding centers and only they are permitted to breed and sell boars and registered females within the country or for export.

Sweden has three kinds of pig farms: (1) Hatcheries-- about 50,000 of them; (2) Breeding Centers-- 180-200 of them; (3) Fattening farms-- 50,000 of them.

Sweden inaugurated pig progeny testing in 1923.

Farm Cooperatives handle about 80 percent of all hogs slaughtered in the country, consumers cooperatives 13 percent, and private operators about 7 percent.

I returned to the United States with a very definite feeling that in view of the good relationships between the United States and Denmark and of the help we have given that country, that there is no sound reason why we should not be entitled to some of the breeding stock from Denmark. I found a growing feeling among Danish farmers that this should be done. They realize that we will eventually catch up in quality of hogs produced, so why should they not sell us breeding stock at a good figure rather than be denied that privilege and yet have competition sooner or later. It may be that something in this regard can be done to the mutual benefit of both countries.

Landrace is the dominant hog in Denmark, Sweden and the Netherlands. We did not return with the opinion that the Landrace hog is the one we should promote in this country. We have a number of well-established breeds and evaluation stations here who are enabling us to select the superior strains in each breed. It might, however, be profitable to have some Landrace from Denmark on test along with our breeds in order to ascertain their relative merits.

In the opinion of Mr. Cox, Professor Bruner and myself, the long experience which Denmark has had in improving animals and in marketing them, warrants the serious consideration of all of us. Their engineering offers a potential and a guide for us in this country. I firmly believe, and many of you hve heard me say, that hog production can be put on a more profitable basis in this country if we will share with one another the best known applications of sound engineering as applied to numbers and time of production so as to enable marketing, slaughtering, processing and distribution to be put on a more efficient and economical basis.

Marketing services, trucks, rail transportation, size of stockyards and packing plants, the labor force-- all are geared to the peak runs on hogs. If hogs could be moved to market as they are in Denmark, the incentive for picking a day would be largely removed and hogs could be handled on a more orderly schedule. We could have more efficient facilities from the farm to the consumer. Packing plants could be smaller yet in a year's time would process as many hogs as present-day larger plants handle. Coolers would be smaller. Less labor would be needed because of the absence of peak runs. Livestock would be moved more directly from farm to market than at present.

All of these savings would result in a substantial additional profit over what we have been earning.

And so the three of us who studied hog production and pork processing and marketing in northern Europe, feel that many of the policies and methods employed there could profitably be used in the United States.

Thank you very much. (Applause)

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MR. AUNAN: Thank you, Mr. Ketner, for your very good remarks concerning the program in Denmark. I am sure that most of us gained and fited by the well illustrated and interesting talk.

There is a slight change in the program concerning the discussion leader. R. F. Wheeler was scheduled to appear as discussion leader. However, I have imposed upon the good will and the good nature of C. L. Strong -- Lowell to most of us -- to lead the discussion. Lowell. (Applause)

MR. C. L. STRONG: Mr. Chairman and Members of the Conference I accepted this assignment from Woodie yesterday, having looked at the program and remembered the titles here and decided that we could not ge into grading a whole lot like we did all morning and it should be a rather pleasant assignment.

Among other things here the grades have been mentioned and the question has been raised with regard to considering dressing percentage as a part of grade, revising the standards to accomplish that end. I only want to comment that our philosophy has been all along -- and we heard a little about it this morning from others -- that the grade is a part of the value determined of livestock, but there are other things that enter into it, that we prefer to separate, such as weight, dressing per cent, fill, and other factors. In the evaluation of swine I have always personally favored talking about yield from a carcass as one elemen and dressing percentage as another rather than the direct computation of yield on a live weight basis. To be sure, you must end up at that level I like to keep these two components separate along the way, so that I can tell that a light yield on a live weight basis was made up because the cutting yield was high or the dressing yield was high, or just exactly what the combination was that contributed to that final figure. So that we can locate what contributed to this final cutout yield on a live weight basis, whether it was high dressing yield or high cutting yield that contributed the most to it.

Testing stations, I am sure we agree, are certainly a tool tha can be very useful in our evaluation program. They can have some of the reservation that Woodie mentioned. This limitation on space, if you please -- in other words, how many stations would it take to test all of the hogs that we have in this country? I think another limitation is brought forth in both the other talks about conditions in Canada and in some European countries. That is, the matter of uniformity of condition from one station to another. An attempt at uniformity was mentioned in both of the other presentations.

Bob Ingram talked about the rations. I think that in Canada last fall we discovered that even though they are trying to keep them similar at all stations, they still recognize differences from one statio to another and they are quite a little more concerned about differences between different stations than they are differences in different statio I think this might be applied to some of our activities in this field, because you recognize that we have several different organizations in on kind or another of testing work and conditions vary from one station to another. It may be a local testing station, a state-sponsored one, or any of a number of other organizations that are sponsoring testing work.

So I think perhaps more progress could be made through conside ing some uniformity of conditions among these various testing programs.

I would call your attention to the fact that whereas some of us at times tend to point to what has been accomplished in Canada and consider that they have arrived, they are still making some changes now and then, trying to improve their lot also. They offered to provide us export stock. On our last stop in Canada last fall - we were almost back, we were across from Detroit -- we ran into a real cynic who said, "You don't need to come up here looking for what to do. You have better hogs down there than we have. You don't need our stock. Your conditions are different. You need to start with what you have and to keep hammering on this meatiness thing. You have stock down there that is meatier than what we have up here."

They allowed that they have taken off fat in Canada, and that is true. We observed it. They do not put as much stress on such things as thickness of muscling as many of our programs have in this country.

Well, I did not come with a speech in my pocket, and so it is time to quit and to call for any questions that you may have to direct to these participants here.

MR. ADAMS: I should like to direct a question to Bob. You went over your percentages of the various grades marketed. Would you go through them once again, please?

MR. INGRAM: Twenty-nine per cent for A, 42 per cent for B-1, and 10 per cent for C.

Incidentally, I have a copy of the Livestock Market Review with me, if anyone cares to look at it. It has that type of information, and you can obtain it by writing to the Dominion Department of Agriculture at Ottawa. They will supply it free.

MR. DEATHERAGE: Well, I am happy to hear that we are getting progress in Canada. The Danish breeders have bred out the fatback and in so doing they have bred out resistance to weather and they have to raise their pigs indoors. With limited feeding and raising them indoors they can get by and do what they are doing. Are you raising your pigs indoors in Canada or how do you solve that physiological bottleneck?

MR. INGRAM: You see a lot of them outside during the winter months, and the sows and larger pigs, but most of the market stock will be produced indoors during the very cold weather in the winter. In the summer months, of course, it is a case of keeping them cool enough, as it is down here.

MR. DEATHERAGE: Our pigs are running around in the winter and summer -- I mean they just can't hold up under a thin layer of blubber, shall we say, and so their mortality is rather high. It can be rather high. I know of one example where thin skinned animals have been brought in here and the mortality has been just terrific. Then we sort of refused down here to go to limited feeding. How did you convince them up there that that was the thing to do?

MR. INGRAM: I think we just had a lot of good salesmen. I think the reason for the way the program went over is due to the fact that the people in the grading service, the people working for the diffe ent provincial departments of agriculture got together on a program and sold it, they agreed on it and just went out and talked it up. We, of course, have a much smaller population to convince than you people do and so maybe that has something to do with it.

MR. RHODES: I should like to ask Bob Ingram how much effect he feels the government premiums had on putting this program over?

MR. STRONG: Did you all hear that? How much effect government premiums had or the incentive payments on the change?

MR. INGRAM: Well, it would only be an opinion that I could express. I don't know. My opinion is that it had a lot to do with it. That is strictly opinion.

MR. STRONG: I might add that we considered this with reference to the report that Bob referred to and you won't find the answer in there either.

Let's have one more.

MR. PEARSON: Lowell, I am just going to throw this out. It is a question that came to my mind when I talked about it with some of our people. I don't think that we are in a state that could institute it, but it seems to me that a program of probing and weights on a firmer weight basis, such as we have in cow testing programs would certainly be useful in swine improvement. I think that certainly one of the large hog producing states should undertake it and get it under way. I think it should be promoted.

Bob Bray tells me that they have done a lot of it in Wisconsin and it has not been received there, but I believe that with a proper job of selling this could be a big incentive in the improvement of the hogs that we are producing. We realize the shortcomings of the hog evaluation program even in our state where we have a limited number and it becomes an impossible task, but with a firm testing program, it seems to me that it might become a reality and very useful.

MR. STRONG: I think that is something that Woodie mentioned here and, although it may not do the full job, it is a step. The way to learn to run is to learn to walk first.

Before turning it back I want to take advantage of the podium they have given me this afternoon to make one little announcement. Many of you know about this but others do not. Some of you asked me about steel tape measures graduated in tenths of inches. Some of you have them and I want to let all the rest of you know where we have found them available. Lufkin Rule Company now has a tape in regular stock, a 16-foot tape in tenths of inches, tape No. C 926 X. That is Lufkin tapes, and I think you can find a local distributor and can buy this tape graduated in inches and tenths of inches.

I realize that some of our instruction sanctioned by this conference calls for millimeters. The first 12 inches here are in fiftieths of an inch, for any of you who want to go to a half millimeter measurement.

Mr. Chairman, I gave it back to you. (Applause)

CHAIRMAN CAHILL: Thanks very much to the Pork Carcass Evaluation Committee. I think they deserve a round of applause. (Applause)

I believe the proper constituents are now present for an official announcement of our election results this morning. The tellers tell me that it was a hotly contested contest, and that the winner and the newly elected chairman of our conference for 1959 is Mr. C. H. Adams of the University of Nebraska. Congratulations, Charlie! (Applause)

Let's take our ten-minute break.

(Recess)

CHAIRMAN CAHILL: Secretary Ken has an announcement of interest to the group.

SECRETARY-TREASURER FRANKLIN: Gentlemen, will you be seated? We are running a little behind schedule, and I am going to give you something for free; so listen. Recently the Board sponsored a research project at Oklahoma State University on the nutritive value of cooked meat. The project was conducted by Ruth Leverton and George O'Dell. I am going to give you a summary of that research with the gracious assistance of my associate at the Board, Miss Rita Campbell, Director of our Nutrition Department, who has just joined us in the room.

Rita, will you stand up so that the members who do not know you may get a chance to become acquainted with you? (Applause) Miss Campbell has suggested that this should be a valuable publication for all of the meats men at the Reciprocal Meats Conference. She has brought over enough copies to give each of you a complete copy of the results of the research project. If you will pick them up at the desk at the conclusion of the meeting you are welcome to them.

Miss Campbell, do I understand that if any other copies are needed that we are in a position to furnish them? So if you know for sure that you can use extra copies, within reason, please leave your name at the desk with Miss Busam, our secretary.

Thank you, Vern. (Applause)

CHAIRMAN CAHILL: You may sit back and rest at ease concerning this time schedule. You folks took care of about half of our business yesterday, we believe; so we can very well use part of the time originally scheduled for a business meeting.

After last evening's performance by a certain gentlemen, a member of our conference, I am going to say nothing more and just abdicate to Bill Cole.

MR. COLE: Thank you.

At the risk of infringing a bit on the Consumer Preference Committee's report, we are going to take about two minutes of your time to help us spell out a form that is now being passed to you. I know that many of us have been asking other people what they prefer in the way of beef and, as Mr. Rhodes said, we need some information on visual preference and eating preference, and along with that cutting knowledge and conformation knowledge and finishing knolwledge of grades; so we would like you to answer these two simple little questions on this questionnaire and they will be picked up at the end of the next speaker's speech and tallied, we hope, before the committee's report is completed.

The first question simply deals with what grade of beef you would purchase if you were going to buy a whole side and put it into your locker. The second question involves dividing a side of beef into fourths, and we would like to have you give us the grade preference by fourths, keeping in mind the usual retail cuts that come from these various quarters.

MR. KETNER: Price considered?

MR. COLE: It says purchase there. You are going to have to use some money to purchase that beef.

Now the first speaker is a young man -- I know he is a young man because he is only two years older than I am. I first became acquainted with him I believe in 1946, at the Regional Swine Breeding Laboratory, at Ames, Iowa, where he was presenting a paper. He left Purdue and went with the beef breeding work as coordinator in the southeastern region, and he has more recently become the National Beef Breeding Coordinator at Washington. So at this time we are going to hear from Mr. E. J. Warwick on a very difficult topic, I feel, the effect of breeding and production on beef carcass characteristics. (Applause)

MR. E. J. WARWICK: Thank you, Chairman Cole and Members of the Reciprocal Meat Conference: I have enjoyed very much being here at this meeting the last couple of days as a guest, and up until this time, at least, I have enjoyed every minute of it,

Now, by agreement with the Chairman I am going to limit my remarks to the matter of breeding as it affects beef carcass characteristic for the reason that I am not qualified to talk on other production factor to any extent, and also because I think that I can profitably utilize all the time allotted to me on the angle of breeding. I ordinarily don't like to read a talk, but I am going to read part of this, since if I did not I am afraid I would wander and take more time than I should.

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EFFECTS OF BREEDING ON BEEF CARCASS CHARACTERISTICS

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The ultimate end of all meat animals is the consumer's table. Thus, any breeding project involving meat animals must necessarily make definite provisions for the evaluation of meat quality. Geneticists involved in the cooperative beef cattle breeding projects have in the past, and are now, working closely with many of you on problems relating to the evaluation of beef carcass quality from an hereditary standpoint. We greatly appreciate the great interest many of you folks have taken in these problems and are especially grateful for the fine working relationships developed in both State institutions and the U. S. Department of Agriculture. The problems involved are not simple, and it is no refection on anyone involved, whether they be geneticists or meat specialists, that all the information we would desire is not yet available. Rather, I feel that the very difficulty of the problems involved should give us all a renewed challenge to dig deeper into them.

Factors affecting quality of beef carcasses, or, to put it in other terms, affecting the value of a beef animal from the consumer's standpoint, can be divided roughly into two categories. First, those things which affect yield both of total carcass and of preferred cuts and secondly, those things which affect consumer desirability of the finished product. These latter factors include both those things which influence the potential customer before purchase is made and those factors which affect the ultimate satisfaction the customer receives from his purchase, namely palatability. It is my purpose in this brief discussion to review information which has accumulated on the effects of heredity on these various factors.

Dressing percentage is a highly variable character due to the effects of finish and amount of fill. It is also apparently an hereditary character - perhaps most strikingly indicated by the commonly observed difference of one and one-half to three percent in dressing percentage between British type cattle and Brahman X British crossbreds handled similarly. Butler et al (1955) observed a difference of 2.73 percent in dressing percentage between Herefords and Braham crossbreds and found that of this difference 1.69 percent could be accounted for by differences in fill, largely differences in contents of the rumen and reticulum, while 0.68 percent of the difference could be accounted for by differences in weight of the empty digestive tract. The Brahma crossbreds also shrank less on an overnight stand than did the Herefords. In their study, sire differences were significant for total fill, weight of the total stomach full, and weight of the full omasum, and abomasum. This apparent hereditary effect within breeds substantiates the concept developed from differences between breeds that there are hereditary differences both in size of digestive organs and in amount of fill which beef animals carry. The observations of Shelby et al (1955) on animals from the Miles City Montana Station, in which heritability estimates of 73% for dressing percentage and 91% for shrink, further emphasize the probable importance of hereditary factors on dressing percentages.

Probably because of the known important influences of environmental factors on dressing percentage and the very great practical difficulties of arriving at accurate estimates, it has tended to be somewhat neglected to date in breeding studies. It would seem to me that the available evidence suggests the desirability of standardizing slaughter procedures, so far as possible, in order that as accurate an estimate of dressing percentage as possible may be obtained. Geneticists should then probably put more emphasis on this in their selection procedures than has been the case to date. From an economic standpoint, I believe that an improvement of 1% in dressing percentage would be approximately equivalent to an improvement of 1.7% in efficiency of production up until the time of slaughter. It may very well be that the 1% improvement in dressing percentage can be attained just as easily as can the 1.7% improvement in production efficiency.

The question of the percentage carcass cutouts of high priced cuts - usually considered to include the round, the rib, and the loin, - is one which has received a good deal of emphasis in animal husbandry literature and in judging practice over a period of many years, but until very recently was one upon which relatively little controlled scientific evidence was available and unfortunately, what little was available had been largely ignored. As long ago as 1893, Wilson and Curtiss, in Iowa Bulletin #20, reported detailed carcass cutouts of a number of steers representing different dairy and beef breeds. Numbers were small but they found virtually no difference in the yield of high priced cuts between dairy and beef types. An examination of their data indicates that the beef animals were somewhat heavier and probably fatter, thus, possibly having been at somewhat of a disadvantage in the comparison. More recently, Stonaker et al (1952) and Willey et al (1951) compared Hereford steers of conventional types with those of the compress type and found virtually no difference in the percentage of the high priced cuts in the carcasses. Butler et al (1956) compared the cutouts of Hereford steers with those of Brahman X Hereford crossbreds, two types differing very greatly in external appearance. Again, only very small and mostly insignificant differences in the percentages of the high priced cuts were found. It, thus, appears to be quite definite that if hereditary differences in the percentages of the high priced cuts do in fact exist they are not closely related to the factors most of us have been taught to look for in evaluating the external appearance of beef cattle.

Work at Maryland (White and Green, 1951; Green, 1954 and Green, et a 1955) in which attempts were made to correlate live animal measurements with yields of wholesale cuts is further evidence in this same direction. Although some relationships were statistically significant they were all small when live weights were held constant and it must be concluded from their work, that the relationships of measurements to yields of the high-priced cuts were very small indeed.

On the other hand, work at the Agricultural Research Center, Beltsville, Maryland, reported by Hankins (1949) showed rather pronounced differences in the yield of preferred cuts (expressed as a percentage of live weight) among individual animals representing beef and dual-purpose Shorthorns and between sire progenies at least in the dual-purpose breed. Since these percentages were expressed on a live-weight basis, it is uncertain how much they may have been influenced by dressing percentage. The data would bear re-examination from this standpoint.

It is, therefore, apparently still uncertain just what emphasis, if any, the percentages of the preferred cuts should receive in any beef cattle breeding program. The heritability of differences independent of dressing percentage has not been clearly demonstrated to date and it has been shown that tremendous differences in conformation as evaluated from appearance of the live animal, may be reflected little if at all in the cutout of preferred cuts. Pierce _et al_ (1956) has grouped carcasses according to conformation independent of amount of finish, and observed trends in the direction of those with preferred conformation having higher percentages of the preferred cuts. In the work he reported, however, amount of finish was of much greater importance in determining yield of the various cuts than was conformation.

Few if any studies have been undertaken to relate conformation to shape of retail cuts or to determine if their shape has an important influence on their acceptability by consumers.

During the past twenty-five years or more, a great deal of effort has been put into taking live animal and carcass measurements. To date I believe it must be admitted that they have been largely unproductive in developing methods for better evaluating animals in relation to their yields and cutout qualities. Does the continued unproductiveness of work of this kind mean that we should abandon it or does it mean that we should pursue it with renewed vigor in efforts to develop better indices? My own opinion is that the questions are important enough to merit further work but that new ideas and unfettered thinking are required.

The composition of carcasses in terms of percentage fat, lean, and bone, is an extremely complicated matter. It is greatly affected by feeding and environmental conditions and by the weight and stage of maturity at which animals are slaughtered. Hankins (1945) reported that, in work at Beltsville, Maryland, beef Shorthorn steers fed out under record of performance conditions to a standard slaughter weight of 900 lbs. averaged 53% lean, 30% fat, and 17% bone, while dual-purpose type Shorthorn steers handled in a similar manner averaged 57% lean, 23% fat, and 20% bone. The average ratio of lean meat to bone in the 9-10-11 rib sample for the beef type steers was 3.19:1 and for the other type 2.85:1. Other observations indicate that beef type animals usually have a higher percent fat and a lower percent lean than do dairy animals fed similarly and slaughtered at comparable weights. It is commonly believed, and observations support the belief, that beef animals of ultra-short, compact types will have a higher percent fat when slaughtered at comparable weights than will animals of larger or more rangy type. This seems reasonable since they are known to mature at lighter weights and at any given weight will have reached a greater percentage of mature weight than will the larger type animals. Differences of the type mentioned above may be influenced very greatly by the type of management the cattle have been subjected to. For example, in recent work at Beltsville, we have made some comparisons of Hereford and Milking Shorthorn steers. These animals have been handled differently up till weaning time at approximately five to seven months of age but subsequent to weaning were handled similarly - being grazed in season and fed on silage in the winter time with minimum grain supplements and slaughtered at about two years of age. Under this type of management regime, percentages of lean, fat, and bone in the carcasses were virtually identical, for the two types. In similar work at Lewisburg, Pennsylvania, in cooperation with the

Federal Bureau of Prisons, Hereford, Milking Shorthorn, and Holstein steers handled in the manner just described showed trends in the direction of dairy and dual-purpose types having higher percentages of bone and somewhat lower percentages of fat in the carcasses, but these trends were rather small and insignificant. In both experiments the differences are smaller than those observed earlier in Beltsville experiments in which full feeding was practice to slaughter at a standard weight of 900 lbs.

Indications are that a number of characteristics of beef cattle related to conformation and to degree of finish have an hereditary basis. The estimates of Shelby et al (1955) based on data from the Miles City Montana Station, give heritability estimates of 42% for slaughter grade, 16% for carcass grade, and 38% for thickness of fat over the eye muscle, indicate that selection for any of these things would probably be effective if it were deemed desirable.

Area of rib eye is related to total lean in the carcass and Shelby et al (1955) observed a heritability of 72% for rib eye area thus indicating further that selection for variation in carcass composition should be effective.

Turning now to characteristics which the consumer wants in demanding beef which is tender, juicy, flavorful, but with a minimum of external fat, we find that a relatively small amount of work has been done in evaluating the heritabilities of traits related to these desirable features.

Work done in recent years by the Department of Agriculture at Beltsville, at the Texas Station (Cover et al, 1957), and at the Florida Station (Carpenter et al 1955), seem to indicate beyond reasonable doubt that there are heritable differences within breeds in tenderness of beef, that there may well be differences between breeds in this regard and that tenderness at best has a low relationship to characters which have traditionally been used to indicate tenderness. Data which can probably be taken as more or less typical of variation often observed in carcass characteristics are given in Tables I and II on cattle fed out at the Miles City and Front Royal Stations in 1957 with the meat evaluation being made at the meat laboratory at Beltsville.

Table I. Observed Variation in Some Beef Carcass Characters Between Sire Progenies, Miles City Montana Tests, 1957. (Seven Progenies 7 or 8 steers per progeny represented).

	High[1]	Low[1]
Dressing percentage	61.4%	59.8%
Rib Area	11.0 sq.in.	10.4 sq.in.
Fat over eye	17.4 m m	12.7 mm
Carcass grade	10.0[2]	13.1[2]
Rib Composition:		
Lean	44.3	43.1
Fat	38.3	34.0
Bone	20.6	18.6
Tenderness Ratings:		
Panel	5.7[3]	5.1[3]
Shear	8.0 lbs.	10.4 lbs.

[1] For each trait. Same progeny not high or low for all traits.

[2] Choice = 8-10-12, Good 14-16-18, etc.

[3] Scale 1 to 7 with 7 most tender.

Table II. Some Breed Comparisons, Front Royal, Virginia, Steers, 1957.

	Breed A	Breed B	Breed C
No. Steers	14	21	21
Dressing Percentage	61.9%	60.8%	60.%
Rib Area	10.9 sq.in.	9.2 sq.in.	10.3 sq.in.
Fat over eye	26.7 m m	27.5 m m	20.3 m m
Carcass grade	13.0[1]	13.0[1]	13.7[1]
Rib Composition:			
Lean	47.8%	45.9%	49.0%
Fat	33.2%	34.4%	29.6%
Bone	18.9%	19.7%	21.4%
Tenderness Ratings:			
Panel	5.9[2]	5.2[2]	5.8[2]
Shear	8.0 lb.	12.6 lb.	10.4 lb.

[1] Choice = 8-10-12, Good = 14-16-18, etc.

[2] Scale 1 to 7 with 7 most tender.

In the Miles City steers, one progeny averaged 8.0 lbs. in the shear test while another averaged 10.4 lbs. Panel ratings of tenderness between sire progeny averages ranged from 5.7 to 5.1 when rated on a scale with 7.0 as the top.

In the Front Royal steers, one breed averaged 8.0 lbs. in shear test and 5.9 in panel rating while another breed averaged 12.6 and 5.2, respectively. Interestingly enough, the carcasses of these two breeds had the same average carcass grades but the breed with the most tender meat had an average of 1.7 sq. inches more rib eye area, slightly less external fat covering, and 1.9% more lean, 1.2% less fat and slightly less bone in the 9-10-11 rib sample. A comparison of this kind gives us some basis for hoping that hereditary differences exist which, if properly exploited, would enable us to breed beef cattle with tenderness, a high percentage lean, and small external fat cover.

No reports have come to my attention of estimates of heritability of other factors associated with palatability of beef.

To summarize, it appears that there is definite evidence of heredity being important in the dressing percentage of cattle, it is of doubtful importance in relation to the yield of preferred cuts of beef carcasses, it is of definite importance in terms of composition of the carcass as evaluated by percentages of fat, bone, and lean, and it apparently is an important factor in tenderness of beef.

The facts reviewed constitute important milestones in the progress of developing information which will enable us to breed for improved carcass quality. From the geneticist's standpoint, however, there are two other and equally important problems, namely, what constitutes a desirable carcass and that of how to best use carcass information for actual improvement through breeding.

As has been brought out previously, virtually nothing in carcass research work to date has given tangible clues as to how factors, other than finish, which can be evaluated in the live animal are related to ultimate carcass quality.

If carcass quality can be determined only from slaughtered animals, then breeding work, leading to the improvement of carcass quality, must be entirely on a progeny test basis. This would put the beef cattle breeder in a much worse position than the dairyman is, since he would have no direct measure of productivity in either sex. The dairyman does have the advantage of being able to measure milk production in his cows and has to reply on progeny test information only so far as the sires are concerned.

With a species reproducing as slowly as beef cattle do, and with the time involved in making suitable progeny tests, progress in selecting for improved carcass traits would be bound to be slow. Further, the high cost of making detailed laboratory examinations of carcasses is such as to make it extremely doubtful that such procedures could be adapted on an industry wide basis at least under present economic conditions.

Therefore, we hope that ways and means of evaluating or estimating potential carcass quality in live animals may be developed so that direct selection may be made for carcass quality without having to depend purely upon progeny test selection. I know that many of you have been fully aware of this problem and that a considerable amount of work is underway along the lines I am thinking about. The use of ultra high frequency sound devices, creatinine excretion, and the dispersion in the body of substances such as antipyrine and deuterium oxide in efforts to estimate either body composition or the thickness of various tissues are some of the things under investigation in this regard. The work reported by Mr. Hiner recently, at the American Institute of Food Technology meeting, on the use of small samples or raw beef in a pressure device to estimate tenderness as well as the various chemical approaches being studied as means of estimating tenderness from small samples give us hope that eventually the use of small biopsy samples may be useful.

I would like to give all possible encouragement to such studies and I believe that, taking the nation over, you will find the Geneticists working on beef cattle problems are not only ready and willing to cooperate with you in any way possible to further the progress of these studies but that to a considerable extent they are breathing down your necks asking that such studies be furthered.

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MR. COLE: Thank you, Dr. Warwick.

I really believe he has given us a challenge. To sum it up I would say that we definitely need to do something about reliable objective procedures that can enhance this program of breeding, so that we can get some of the eating quality that we know we want. The next paper, to be presented by L. D. Wythe, I think is an attempt in that direction of objective measurement, and his topic is "The Relationship of Bone to Muscle in Beef Carcasses." Mr. L. D. Wythe from Texas A. and M. (Applause)

MR. L. D. WYTHE: Thank you, Bill.

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THE RELATIONSHIP OF BONE TO MUSCLE IN BEEF CARCASSES

L. D. WYTHE, JR.*

TEXAS A. & M. COLLEGE

Introduction

Considerable interest has arisen among meats research personnel within the last few years on size of bone as an indicator of muscle development. This interest is nothing new as beef cattle producers, cattle feeders, cattle buyers and beef processors have for years been concerned about the amount of bone in cattle and its economic importance. Lush in 1926 stated, "The whole problem of size of bone in its relation to meat value, to the desirabilities of cattle as feeder cattle and to the desirability of cattle for range--beef production is a large one".

Little consistency has been shown in live animal visual appraisal as we often deman heavy boned breeding cattle and then do an "about face" and "praise" slaughter steers for possessing quality and refinement of bone. Bone characteristics are fundamentally determined by inheritance; however, the level of nutrition probably has some influence on the development of bone. Since muscles are attached to bones and their chief purpose is to operate or move the bones, it seems logical that their size and shape is associated with the size and shape of bones.

Several major factors must be considered when one undertakes to find the relationship of bone to muscling:

1. Accurate, useable indicators of bone thickness both on the live animal and in the carcass.
2. Variations in amount and distribution of fat.
3. Variations in age, weight and perhaps breed and previous environment.
4. An accurate, easily obtainable measure of muscling.

Considerable work has been done or is presently underway in the field of bone-muscle relationships, but very little has been published on the subject as such. There are conflicting reports and ideas in the published literature.

Review of Literature

Hammond (1921, 1932) McMeekam (1940, 1941), Palsson (1939) and others in England and New Zealand have completely dissected many thousands of meat animals (mainly swine and sheep, but some cattle), separating, weighing and measuring each individual muscle and each individual bone in the body. This work involves a slow, meticulous separation of the tissues using scalpels, forceps, and scissors while keeping the cut covered as well as possible with damp towels to avoid evaporation. These workers have found a strong positive correlation between the weight of bone in each animal and the weight of muscle tissue. McMeekan (1956) stated "So strong is this relationship that the weight of muscle could be determined within one percent if the weight of the cannon bones are known". He also said, "On the average fine boned animals will kill out with a smaller percentage of lean meat and a larger percentage of fat at the same weight then will a stronger, thicker boned beast".

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*Assistance of G. T. King, R. L. Simms, Frank A. Orts, Ray H. Means, J. J. Guenther, B. J. Bland and statistical laboratory staff is acknowledged.

Walker (1958) has found correlations of .9/ between cannon weight and muscle weight and between total bone weight and muscle weight of Jersey heifers. In this work each muscle was removed and dealt with as an entity. Walker (1958) further reported that she used weight/length ratio as an indicator of bone thickness.

Callow (1948) reported that the ratio between weight of muscular tissue and bone increases during fattening and when carcasses contain over twenty percent fatty tissue the percentages of muscular tissues, bone tissue, tendon, etc., all decrease as the percentage of fatty tissue increases.

Hankins et al (1943) observed a significant difference between the muscle-bone ratio of beef and dual purpose shorthorns and also a significant difference between muscle bone ratios of the progeny of sires within each type. This indicated that muscle bone ratio is a rather definitely inherited characteristic. Correlations between muscle bone ratio and live animal measurements gave little indication that selections could be made on the basis of conformation as evaluated by such measurements.

Lush (1926) reported the percentage of leg bones (front and rear shanks) to be very good indicators of the percentage of gone in the dressed side of beef, but that this was largely a secondary effect of the primary factors of age and fatness. Little or no evidence of any relation between dressing percent and percentage of bone was found when the degree of fatness was constant.

Workers in the Bureau of Animal Industry, U.S.D.A. (1935) and Hankins et al (1946) found the percentage of bone and lean in the nine-ten-eleven rib cut provided a basis for estimating the bone and lean content of the dressed beef carcass. This has been substantiated by Cole et al (1958) and others.

Weseli et al (1958) and Good (1958) reported a simple correlation coefficient of .22 and a partial correlation coefficient (among steers of similar weight) of .11 between trimmed cannon circumference and ribeye area from 153 Angus, Hereford and Shorthorn steers entered in the 1956 International Carcass Contest. Significant, but small correlations were found when live bone score and live measurements (circumference of left metacarpus and frontal and lateral measurements midway between the knee and pastern joint) were correlated with clean metacarpus measurements (metacarpus freed of all excess tissue and measured in the same manner as live measurements). This study indicates that live animal measurements are not too useful for predicting actual bone measurements.

Merkel and Boughton (1958) found nonsignificant correlations between live front shank cannon circumference and loin eye area from 53 Hereford heifers and 30 Hereford steers when the effect of weight was removed. These workers reported nonsignificant partial correlations between area of round muscles and live front cannon circumference in both steers and heifers, but they did find highly significant simple and partial correlations between live cannon circumference and percent commercial round and between combined percent rib, loin, round and chuck and cannon circumference in heifers. These same correlations were not significant in steers. This indicates differences in muscle-bone relation due to sex. Merkel further stated that certain head measurements were not well associated with muscling characteristics.

Arthaud (1958) reports low simple and partial correlations between live measurements (circumference of front and rear shank and length of front and rear shank measured from the breakjoint to the dew claw) and are of ribeye on 50 head of cattle slaughtered in 1957.

Butler et al (1956) concluded that bones tend to develop proportionally in beef animals. Muscles are attached to bones at their origin and insertion, so muscle weight in different wholesale cuts tends to be proportionate.

Experimental

Detailed slaughter, carcass and bone data were obtained from 73 Hereford and Brahman Crossbred steers and 16 Hereford and Hereford x Angus heifers. The slaughter procedure was essentially as recommended by Deans (1951). Both sides of the carcasses were cut by procedures described by Hankins and Howe (1946). Measurements were made in a manner described by Naumann (1951).

The procedure used in obtaining bone data is outlined below.

1. Weigh removed shanks and feet and head.
2. Remove feet, phalanges, tendons and other extraneous matter from metacarpus and metatarsus.
3. Weigh and measure length (with calipers) of both left and right cleaned metacarpus and metatarsus.
4. Weigh and measure length of both left and right cleaned tibia. (Tibia minus tuber calcis.)
5. Weigh and measure length of both left and right cleaned femur.
6. Weigh and measure length of both left and right cleaned Radius Ulna. (Minus carpal bones.)
7. Obtain width (lateral) and depth (frontal) measurements of metacarpus and metatarsus at midpoint of length with sliding vernier caliper.
8. Saw metacarpus at midpoint of length, trace and compute cross-sectional area with planimeter.

9. Calculate weight/length ratios by dividing the weight of each bone by its length.

10. All bones were kept in the cooler and cleaned and weighed as quickly as possible to prevent loss from evaporation.

The rib, chuck, loin and round were given a retail trim so that all fat in excess of 1/4 to 3/8 inch and excess bony portions were removed. These trimmed cuts were used as indicators of muscling as they were thought to be more uniform in fat content than wholesale cuts. The longissimus dorsi muscles (rib eye) of each carcass were traced at the twelfth rib and a planimeter was used to determine the cross section area in square inches.

Results

Analysis of the data from the heifers and Brahman crossbred steers has not been completed.

A number of simple correlation coefficients were computed using data from 28 Hereford steers which were fed for 215 days, represented six herds, and averaged 559 pounds of chilled carcass with a range of from 426 to 715 pounds.

Highly significant correlations were found between the weights and between the lengths of metacarpus, metatarsus, tibia, femur and ulna-radius. (Table 1)

Table 1. Correlations between the weights and between the lengths of trimmed metacarpus, tibia femur, metatarsus and ulna-radius. 1958.

Bone Weight	Metatarsus	Tibia	Femur	Ulna-Radius
Metacarpus	.960**	.936**	.887**	.947**
Metatarsus		.959**	.912**	.943**
Tibia			.967**	.971**
Femur				.942**
Bone Length				
Metacarpus	.969**	.857**	.797**	.881**
Metatarsus		.878**	.806**	.883**
Tibia			.959**	.966**
Femur				.954**

**Significant at .01 level

These high correlations are further proof that bones develop proportionately both in length and weight.

Highly significant correlation coefficients between trimmed bone weights and weights of certain beef cuts, as well as area of eye muscle, are shown in Table 2.

Table 2. Correlations of trimmed bone weights with certain beef cut weights and area of eye muscle. 1958.

ITEM	Trimmed Bone Weight				
	Meta-carpus	Meta-tarsus	Tibia	Femur	Ulna-Radius
Sum Loin, Rib, Round (rump on. regular whls. cut)	.634**	.676**	.737**	.721**	.792**
Sum of Retail Trimmed Rib, Chuck and Loin	.690**	.709**	.783**	.773**	.811**
Trimmed Boneless Cushion Round	.635**	.680**	.760**	.769**	.793**
Area of Eye Muscle	.645**	.680**	.686**	.635**	.707**

**Significant at .01 level

Correlations of bone lengths with weights of various beef cuts and area of eye muscle are shown in Table 3.

Table 3. Correlations of bone lengths with weights of various beef cuts and area of eye muscle. 1958.

ITEM	Bone Lengths				
	Meta-carpus	Meta-tarsus	Tibia	Femur	Ulna-Radius
Sum Loin, Rib, Round (rump on. Regular whls. cut)	.575**	.589**	.792**	.823**	.812**
Sum Retail Trimmed Rib, Chuck and Loin	.582**	.582**	.782**	.831**	.817**
Trimmed Boneless Cushion Round	.583**	.603**	.806**	.847**	.813**
Area of Eye Muscle	.537**	.483**	.629**	.693**	.634**

**Significant at .01 level

The highly significant correlation coefficients of weight/length ratios of certain bones with weights of various beef cuts and area of eye muscle are shown in Table 4.

Table 4. Correlations of weight/length ratios of certain bones with weights of various beef cuts and area of eye muscle. 1958.

ITEM	Weight-Length Ratio		
	Metacarpus	Metatarsus	Tibia
Sum Loin, Rib, Round, Chuck (rump on, regular whls. cut)	.579**	.623**	.583**
Sum Retail Trimmed Rib, Chuck and Loin	.648**	.676**	.656**
Trimmed Boneless Cushion Round	.615**	.675**	.639**
Area of Eye Muscle	.612**	.699**	.589**

**Significant at .01 level

These correlations look promising and indicate that a strong positive relationship between bone thickness (weight/length ratio) and muscling (trimmed boneless cushion round, ribeye area, etc.) existed in the 28 steers in this study. It is realized, however, that some part-whole correlations resulted from these comparisons and no adjustment was made for weight or age differences.

A great deal of work is still needed in this field, since the composition of beef carcasses is becoming increasingly important to the beef producer, processor and consumer. We are looking for reasonably accurate, simplified methods of detecting muscling and percentage edible portion in live cattle. Perhaps some measure of bone thickness will give us this criteria We are searching for better ways to determine bone thickness both in the live animal and in the carcass. We are striving to find the upper and lower limits of bone thickness as related to muscle development.

I think these problems can and will be solved in the near future, which in turn will be beneficial to all segments of the beef cattle industry.

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MR. COIE: I would say that is very good, and I think the people in Texas should be congratulated on this type of work. It is meticulous, it is hard, and it is something that we all have to do if we are going to help to solve these problems we are faced with in beef carcass evaluation.

Now in working out this program the committee suggested topics, and I should like to say at this time, Vern, that if anybody has any idea for the committee he should feel at liberty to contribute the suggestion because we would like to have it even though the person doesn't happen to be on the Beef Carcass Evaluation Committee. I am sure the chairman next year will welcome any suggestions that are submitted.

I must admit that we have a most unique report here, and the committee planned it that way, I am sure, to save the best until the last. We have a lady on our committee, and she is a grand, capable person. Miss Cover is going to talk to us about an approach to measuring beef tenderness. (Applause)

MISS SYLVIA COVER: Mr. Cahill, Mr. Cole and Members of the Reciprocal Meat Conference: I am afraid I cannot live up to all the nice things that have been said about me, but I do appreciate being invited to speak.

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AN APPROACH TO MEASURING TENDERNESS OF BEEF

SYLVIA COVER

TEXAS AGRICULTURAL EXPERIMENT STATION

Because tenderness is such an important component of the eating satisfaction of meat, a reliable method of detecting it is greatly needed. Such a method ought to be suitable for detecting tenderness or toughness in the steak before it is cooked, in the wholesale cut, in the carcass, and in the live animal. Until the chemical and physical causes of tenderness or toughness are understood completely, our chances of detecting or controlling it adequately seem remote. Therefore, it is important to begin systemetic efforts to tabulate the various kinds and degrees of tenderness impressions observed under standardized conditions. If this is done well, then perhaps we may be able to associate these observations with pertinent chemical or physical changes or with differences in management or breeding.

In the past, members of a judging panel have been asked to record only one score for tenderness of beef. When such scoring is done on only one cut cooked by only one standardized method, scoring for tenderness is relatively simple. But when judges are presented with meat from different cuts cooked in several different ways, they must relate a variety of sensations to tenderness. Then, scoring may be exceedingly complex and the scores difficult to interpret. A few illustrations may make this point clear. Judges' scores for tenderness of rare steaks may be influenced by their softness. Swallowing these soft juicy morsels may take place before the tenderness of either the muscle fibers or the connective tissue has been assessed. But coarse connective tissue will be very evident in soft juicy morsels from rare bottom round steaks if they are chewed thoroughly. In very well-done braised steaks the meat may seem hard at first, but in bottom round it may break up readily after a few chews. In this case the muscle fibers may crumble easily into tiny fragments and little or no connective tissue may be felt. With braised loin steaks, however, the meat may be stringy because little connective tissue is present and the muscle fibers are only slightly friable. Such differences in tenderness characteristics are difficult for a judge to report in a single score for tenderness. Yet if chemical causes of tenderness or toughness are to be investigated, precise descriptions of tenderness changes during cooking are imperative. It is especially important to separate toughness caused by connective tissue from that caused by muscle fibers. Breaking tenderness down into a component from muscle fibers and one from connective tissue was attempted by Lehman (2) as long ago as 1907.

Various mechanical devices for measuring tenderness objectively have been constructed. Mr. Schultz did a very good job of listing and describing them for your meeting last year (3). But no one of these devices measures all aspects of tenderness.

It seemed possible that intelligent personnel might be trained to discriminate among the different tenderness sensations and to give information which it is not yet possible to obtain from mechanical devices. The description of two such attempts is presented in this paper.

First attempt. Separation of tenderness components was attempted first with the 1955 Bluebonnet steers, using separate scores for muscle fibers and for connective tissue (1). But in that study a connective tissue score was reported only when obvious connective tissue was identified by sight or detected during mastication. Thus, not all samples received a score for connective tissue. A score for muscle fibers was obtained for all samples It included not only the tenderness of the muscle fibers but also the tenderness of any connective tissue which seemed inseparable from them. The data collected that year included steaks from longissimus dorsi in loin and biceps femoris in bottom round. Both muscles were cooked by broiling to internal temperatures of 61°C. (rare) and 80°C. (well-done) and by braising to internal temperatures of 85°C. (medium) and of 100°C. plus holding there for 25 minutes Thus, there was an opportunity for wide differences in tenderness. The results of these tests are shown in Table 1.

The data on connective tissue suggest that differences were detected. Because 52 pieces of meat from each method of cooking had been presented to each of four judges, there were 208 opportunities to report connective tissue. For longissimus dorsi there were fewer than 20 such reports within any of the 4 conditions of cooking; while for biceps femoris there were more than 180 (Table 1). Thus, in only an occasional loin steak did an occasional judge find identifiable connective tissue and even then it was relatively tender. In bottom round steaks however, most judges found identifiable connective tissue in most of the steaks and it was tougher than that found in the loin. The different conditions of cooking did not seem to affect greatly either the tenderness of the connective tissue or the frequency of reporting, except when the steaks were braised very well-done (100°C.+ 25 minutes). In that case, the connective tissue in both cuts seemed to be somewhat more tender and the number of reports were somewhat fewer than with the other three conditions of cooking. Braising very well-done employed those cooking conditions usually considered favorable for changing collagen into gelatin and thus tenderizing the connective tissue.

A tenderness score for "muscle fibers" was obtained on all samples. In both cuts, the fibers were significantly more tender broiled rare than well-done. When longissimus was braised to the two internal temperatures no significant difference was observed, but biceps femoris was significantly more tender braised very well-done than to 85°C.

Juiciness scores were highest when the cuts were broiled to the lower internal temperature and were lowest when the cuts were braised to the higher internal temperature.

The shear force values indicated that loin steaks were most tender when broiled rare, but that bottom round steaks were most tender when braised very well-done.

Second attempt. A second attempt at measuring various aspects of tenderness was made with the 1956 Bluebonnet steers. There were 55 steers and steaks from loin and bottom round were cooked in the same ways as before. Tenderness was divided into scores for softness, friability and tenderness of connective tissue. The score card used in that study is shown in Table 2. The judges were given a preliminary training period. They were told that softness should be rated according to the sensations from tongue and cheek and by the ease with which the teeth sink into the meat at the first bite. Friability should be determined on how easily crumbling of the muscle fibers takes place. Tenderness of connective tissue should be judged in three ways: none is felt; some is felt or heard during chewing, but all of it disappears during chewing; some connective tissue is left in the mouth even after thorough chewing and must be either gulped or discarded. This latter type of connective tissue is likely to be called "gristle" by homemakers.

TAES, Department of Home Economics

Table 1. Juiciness and Tenderness Data for 1955 Steers, averages of two steaks from each of 26 animals

Methods of cooking	Cuts	Final cooking temp.	Juiciness scores	Shear force values	Tenderness scores	
					Muscle fibers[a]	Obvious connective tissue[b]
Broiled	Loin	61°C.	8.7	7.4	7.2	5.0 (16)
		80°C.	5.3	9.8	6.0	4.9 (14)
		(c)	***	***	***	
	B.R.	61°C.	9.2	9.7	6.7	2.2 (208)
		80°C.	5.3	9.2	5.3	2.5 (194)
		(c)	***	n.s.	***	
Braised	Loin	85°C.	5.8	9.4	5.6	5.3 (16)
		100°C. +	3.3	9.3	6.0	7.2 (9)
		(c)	***	n.s.	n.s.	
	B.R.	85°C.	5.3	9.4	5.4	2.7 (187)
		100°C. +	3.4	6.4	6.5	4.9 (181)
		(c)	***	***	***	

(a) These scores include also any connective tissue which seemed indistinguishable from the muscle fibers.

(b) Total number of possible judgments was 208. Number of scores on which average is based is given in parentheses.

(c) n.s., *** indicate significance above 5% level, and at 0.1% level respectively, determined from analyses of variance.

The broiled steaks of both cuts, when rare, were scored very juicy, soft, and moderately friable, but when well-done they were scored medium in juiciness, medium in softness and friable. Thus, as doneness increased these broiled steaks became less juicy and less soft but more friable. The connective tissue in the loin was so tender that there was little or no room for improvement with doneness, but in bottom round, the rare broiled steaks had considerable firm connective tissue which tendered significantly as doneness increased. Shear force values increased with increased doneness in broiled loin steaks--the meat got tougher--but broiled bottom round steaks showed no significant change with doneness.

TAES, Department of Home Economics

Table 2. Adjectives Used in Scoring Meat and Associated Weighting (1956 data)

Weighting of adjectives	Adjective used in scoring			
	Juiciness	Softness	Friability	Tenderness of residual connective tissue
10	Extremely juicy	Extremely soft	Extremely friable	No C.T. felt
9	Very juicy	Very soft	Very friable	Tiny amt. of soft C.T.
8				
7	Juicy	Soft	Friable	Small amt. of fairly soft C.T.
6				
5	Neither juicy nor dry	Neither hard nor soft	Moderately friable	Small amt. of firm C.T.
4				
3	Dry	Hard	Slightly friable	Medium amt. of firm C.T.
2				
1	Very dry	Very hard	Very slightly friable	Large amt. of hard C.T.
0	Too dry to swallow	Too hard to chew	Not friable	Residue very hard

The braised steaks of both cuts became less juicy as doneness increased. In the loin steaks, which were braised, doneness did not seem to affect scores for softness, friability, and tenderness of connective tissue, but in bottom round steaks the ones which were braised longer were softer, more friable and the connective tissue was more tender. Shear force values of braised steaks increased with doneness in loin (the meat got tougher) but decreased with doneness in bottom round (the meat got more tender).

Thus far our research has confirmed some of the old ideas about connective tissue: it is present in larger amounts and is tougher in bottom round than in loin; and, where it was tough and was present in considerable amount, its tenderness increased markedly with increases in internal steak temperature. But, we do not understand the difference in the chemical make up of the connective tissue in loin and bottom round. Does the heavy tough connective tissue of bottom round differ qualitatively as well as qantitatively from that in loin? Are there more elastic fibers in one cut than in the other? Does one cut have denser collagen than the other? Good correlation of judge's score for connective tissue with a chemical constitutent of connective tissue would be desirable.

That our former theories on tenderness of muscle proteins are not adequate is indicated by our research. The familiar principle of meat cookery, "High heat toughens protein", seemed to apply to the fiber proteins in longissimus dorsi muscle but not to those in biceps femoris. This contrast in tenderness of the muscle fibers in the two muscles opens the way to considerable new research. A new approach to inherent chemical differences may be possible. The heritability of the animal may prove to be related not only to tenderness as tested by taste panel but also to tenderness as determined by chemical methods.

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MR. COLE: Well, I was right, I think. I believe you will all agree with me that certainly Miss Cover is doing a fine job and, as she said or as that oldster said, we are continually finding new things that are not right, and we have a real job cut out for us in the future.

Now Vern says that we have a few minutes, although my watch says it is after time, but I think we got a little late start, and I should like to open the floor to questions.

I believe that both of these last two talks are available, that they are in printed form and are being distributed. incidentally, some of you saw Mr. Warwick leave. He had to catch a plane, and if any questions are directed to him, we will turn them over either to Mr. Wythe or Miss Cover to answer.

Do you have any questions?

MR. SULZBACHER: I should just like to say in response to Miss Cover's opening remarks that our composition of quality investigation group, which is under the direction of Clifton Swift, whom you all heard yesterday morning, has been working on the differences in composition of different muscles, and we are coming up with rather remarkable differences in the proteins of different muscles. Some of the early results of this work were reported at this year's AMIF meeting, and we look for a good many more of them to be reported as time goes on.

MR. COLE: Thank you, Mr. Sulzbacher. Are there other questions or comments?

MR. BRATZLER: I hesitate to get up. I am not doubting those correlations, they are excellent, but before you folks get too hepped on the bone measurement and length you should ask Leon if he keeps the whole weights constant on the carcasses. I have a sneaking suspicion from a recent oral examination that the significance went down when the weight was held constant. How about that, Leon?

MR. ORME: I don't know. I left the pieces home.

MR. COLE: That boy is going to Tennessee.

MR. ORME: We did measurements on the cannon bone only on 31 Hereford and Angus cattle of comparable age, comparable conformation, and breeding. Our weights and lengths probably were comparable with the correlations that were given here in relation to weights of wholesale cuts and also to ribeye area, and I think -- well, I will go along with Professor Bratzler. I think when you run standard coefficients on them and hold the weights constant they decrease quite rapidly.

MR. WYTHE: Did you run any weight-length ratio correlations?

MR. ORME: No, we did not.

MR. WYTHE: That might partially answer that.

MR. ORME: We combined two of them, the weight and length of the two best ones. We did some circumference measurements and some radius measurements and they were not too good at all, on metacarpals and metatarssus. Maybe Mr. Pearson can remember more of the data on the correlations.

MR. PEARSON: I did not mean to get into this, Leon. I would just as soon you left me out because I left my memory at home, too. From memory, I think that our correlations were lower than yours, and we did not combine the length and width measurements, but working with both the front and rear cannon bones from both legs and also working with x-ray -- I think x-ray was the thing -- we worked with x-ray at the lumbar region, and there was very good correlation between different measurements taken from the lumbar region and the x-rays and the weights of cannon bones in relationship to actual leanness, and physical separation of the 9th, 10th and 11th rib section was quite low.

I should say that is when you put them on a percentage basis. If you put them on a weight, such as your figures are on, they look good. If you don't take weight out they look pretty good, but if you take weight out and put them on a percentage basis they look quite low.

MR. MERKEL: Our correlation looked very much like that until we removed the weight effect and then the correlation decreased to almost either being just barely significant or to no significance. However, I do want to say that our boning measurements were actual measurements on the live animals, that is, we measured the length, the height, and everything. We did not attempt to take the bones from the slaughtered animals and to make any measurements on the bones per se as you indicated. That maybe one of the reasons our correlations are slightly lower than yours to begin with.

MR. ORME: We compare the circumference of the live animal versus the circumference of the clean bones and the correlation is not too good.

MR. WYTHE: I might add here that a few correlations were run on the Brahma cross bred cattle and it seems from the Brahma blood you get in there you can always tell how long the cannon bone is.

MR. HECK: I was wondering if they had any way of measuring the amount of calcium in the bones which might increase the weight of the bones. It could be an indication of bone washed out of calcium and that would influence the weight, would it not?

MR. COLE: I believe you said something about specific gravity a while ago.

MR. WYTHE: We have made no measurement of the actual viscous bone. I think that needs to be looked into.

MR. KING: I would like to ask, did you do specific gravity or was it all live?

MR. ORME: It was all live animal measurements. What we tried to do in this study is we tried to correlate the various live animal measurements with the carcass. We did not do specific gravity on bone. We did some breaking strengths on bones, trying to relate breaking strengths to tenderness.

MR. KING: I should like to add that we certainly are not presenting this as the solution by any means with that small number of cattle. The fantastic results that are presented in the literature by our New Zealand workers and our English workers show some promise. We have attempted to duplicate them and we cannot, or we have not, but I think it is another tool that might be pursued or used in trying to discover some objective measure that might be used in evaluating the live animal without having to destroy it to determine whether it is worth anything or not.

MR. PEARSON: I should like to ask one question. In our work we have read the claims in the New Zealand literature of Hertzel and in the Australian literature of Mr. McMeakin; yet we have never found data in detail that justifies their statements. I don't know whether you have found anything in more detail. We have read some popular statements from them but nothing that justified it from a scientific standpoint.

MR. WYTHE: I have had some correspondence from Miss Walker and I understand that Mr. McMeakin was in Europe and I was not able to get in touch with him personally. However, I heartily agree with the statement that you made.

MR. COLE: I should like to ask somebody from Texas what would have happened if you had used total bone as compared with one bone correlated with the same cuts.

MR. WYTHE: The same picture, the weight of--

MR. COLE: No, I mean when you do a lean-fat bone separation, if you just correlate total separable bone.

MR. KING: We didn't do that. I should like to answer your question, too. We had Miss Walker on our campus and we could not get anything out of her either.

MR. WELLINGTON: Just as a wee bit of defence of McMeakin and his group, we corresponded with him relative to statements which he was quoted as making in the Shorthorn World on this problem of bone and its relationship to muscle weights and he explained that he really did not author that article, that it was rather lifted out, and if you are referring to the Shorthorn World report he really does not take credit for what is written in it.

MR. KING: I am referring to direct questions asked of Miss Walker, George.

MR. WYTHE: Isn't Mr. Birmingham from New Zealand? Maybe he can answer the question.

MR. DEATHERAGE: Well, I would turn back to Miss Cover. She apologized for the bit that she has done, but she is the only one as far as I am concerned who has ever done any work on meat cookery that is scientifically solid and I really think it is too bad that she could not tell us a little more. Particularly it is very significant, I think, that she has clearly shown these differences in muscle that we have known do exist. I don't know whether she has given anybody else any ideas but she has given me enough ideas to keep me busy for five years if I can get some hands to help me.

MR. COLE: Miss Cover, that is your objective, isn't it?

MISS COVER: Yes. We have plenty to keep us busy too. All of you can get into it.

MR. COLE: I think that is one thing we all realize from these conventions.

MR. R. L. HINER: We were quite actively engaged in the use of the objective method for determining tenderness of live animals. We approached it from both the chemical and the mechanical tenderness technic. We are now actually engaged in separating the amino acids, and we do find differences. We do find definite differences in the amino acids on our meat-o-graphs, between muscle from tender animals and muscle from tough animals or between two muscles from the same animal, one being tender and one being tough. We are now in the process of trying to identify these amino acids or acids and to relate them in our panel testing.

We are also using pressure to determine tenderness and, as reported at the AMIF meeting, we have a correlation of .899 between the pressure required to exude juice from a pressure sample as compared with a palatability committee which tested the meat after 10 days. That probably is as high a correlation as I have seen with objective procedures. We hope to increase the size of our cylinder, so that we can take a small biopsy sample from the semitendinosus of a round of beef.

MR. COLE: The Chairman says our time is up but I think we want to take just a minute or two more.

MR. KING: I just want to ask Mr. Cole if he would mind divulging a few of his secrets. He has done some of this work, too, and he has been mighty quiet about it.

MR. COLE: We have not done anything spectacular. We have just been doing routine work which we know is the tedious separation, and I don't think we are ready to report anything as yet. We do have some interesting work on types and breeds and I for one am anxious to find out -- we might have a word to say after we receive the report over here. Bob Dynes and Carroll Schoonover helped us to do the work. Let's see what it looks like.

Question No. 1: What grade of beef would you purchase if you were going to put it into your locker as a whole side? What is the total number by the way?

MR. SCHOONOVER: I don't know. We didn't tabulate it.

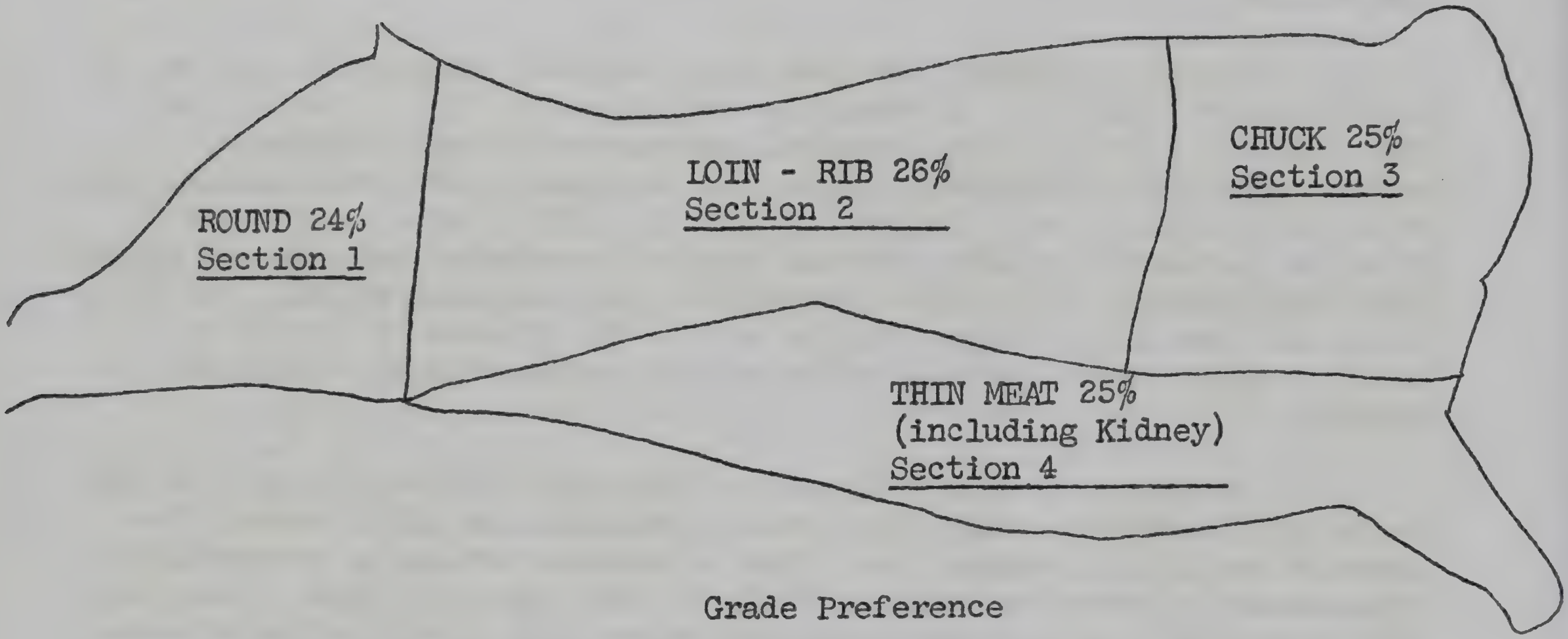
Beef Carcass Evaluation Committee

Questionnaire - 11th Reciprocal Meat Conference 1958

1. What U. S. D. A. grade of beef would you purchase, if a whole side were to be processed for your locker or home freezer?

   Prime 2.2%, Choice 46.7%, Good 47.8% and Std. 3.3%

2. Indicate the U. S. D. A. grade you would prefer for each of the four sections of the beef side shown on diagram. Take into consideration the usual retail cuts obtained from each section.


ROUND 24%
Section 1
LOIN - RIB 26%
Section 2
CHUCK 25%
Section 3
THIN MEAT 25%
(including Kidney)
Section 4

Grade Preference

Section 1 P 15.6 - Ch. 46.9 - Gd. 34.4 - Std. 3.1

Section 2 P 9.6 - Ch. 64.9 - Gd. 24.5 - Std. 1.1

Section 3 P 2.1 - Ch. 22.3 - Gd. 67.0 - Std. 8.5

Section 4 P 0.0 - Ch. 3.2 - Gd. 44.1 - Std. 48.4 - Util. 4.3

Remarks:

Approximately 100 participants

(optional) Name ______________________________

MR. COLE: We have 2 in prime, 42 in choice, 43 in good, and 3 in standard. It looks like it is a toss-up between choice and good.

The second question, section 1, refers to the round broke down in fourths. How many of you realized that a side of beef could be broke down in fourths like that? That is the Meat Board style. Those are the percentages right off of the Meat Board chart. Two prime, 42 choice, 43 good and 3 standard. Someone put down the utility grade. Outside of that they use only four grades. Of the No. 1 section, which is the round, 15 out of the -- it looks like 96 people -- 15 out of the 96 people, which is actually about 15 per cent, prefer prime, 45 choice, 33 good and 3 per cent standard.

On the next one, on the loin rib section, 9 per cent prime and 61 per cent choice. That is a surprise to me. I thought more than that would take prime. Twenty-three good and only one standard.

Then on the third section, which is the chuck section, 2 per cent prime, 21 per cent choice, 63 per cent good, and 8 per cent standard.

In the thin meat section, the belly section, no takers on prime, 3 on choice, 41 on good, 43 on standard, and 4 on utility.

That points up one thing. I will have to admit that I sort of forced this on the committee -- this survey and that is the complexity of beef carcass evaluation work. I do not feel that we can concentrate on one section and do a good job. In other words, if we do all our work on the rib section or the loin section, we are eliminating maybe 75 per cent of the carcass when we see quite a variance in grades. That also points out that the beef animal is far from being perfect in any grade, because we don't seem to have anything we want in, say, a side in any one of the grades. It makes no difference what it is.

Now I am going to conclude by saying that I know we do have a fat problem in beef carcass evaluation work. Maybe we are no better off than the pork people. I do feel that probably in pork evaluation there has been quite a bit of negative thinking on the meat type hog and that the way to produce them is to remove the fat, but that is just half the problem, I think in beef carcass evaluation. I hope that we are not accused of taking a negative approach. I think that we should assume a positive approach which is a more edible portion of high eating quality.

Thank you. (Applause)

CHAIRMAN CAHILL: I think that is a very excellent note on which to end the formal part of our two-day conference. I realize that the discussion periods have not been long enough for some of you to get your questions answered; so I implore you to corral the individuals whom you might think are able to answer your questions and discuss them to your heart's content during the remainder of the evening and possibly the next day or two.

I believe that Don Naumann has an announcement concerning the Teaching Committee.

MR. NAUMANN: I had lunch with Ken Franklin and I pointed out to him that the syllabus of the basic meat course, to which we referred in the Teaching Committee, is not in the previous proceedings of this conference. It will be included in this year's proceedings.

(See conclusion of proceedings for the syllabus)

Thank you.

# # # # # # # # # #

CHAIRMAN CAHILL: I believe that we are ready for our business meeting. If we follow the normal and preferred scheme of handling the business meeting and if you folks should vote in a certain way that would create the necessity for a ballot vote, we will find ourselves in a rather time-consuming situation. So with your permission I wonder if we might deviate a little and pick up at the beginning of our business meeting a point which we left last night.

Yesterday morning we made an announcement concerning some letters up here on the table. Yesterday afternoon, at the end of our afternoon session, we discussed it a little further. I am referring, of course, to the question as to whether our 1959 conference will be held in Chicago or elsewhere. I wonder if you would like to consider that as the first item of business in our meeting today.

MR. KEMP: Mr. Chairman, I move that we vote on whether or not to have it somewhere else by a show of hands.

CHAIRMAN CAHILL: You have put that in the form of a motion. Do you want to make it one way or the other?

MR. KEMP: I move that in 1959 only. I am only referring to next year.

CHAIRMAN CAHILL: That the 1959 conference -- we need a positive approach, I think, Jim.

MR. KEMP: I move that the 1959 conference be held on a campus.

MR. KUNKLE: I will second that motion.

CHAIRMAN CAHILL: It has been moved and seconded that the 1959 conference be held on one of the campuses.

MR. NAUMANN: For your consideration, I would suggest that unless we vote on this every year we might consider changing that motion to put it in terms of alternate years or in some other sequential form, rather than just the one year. That is just a suggestion. It is not an amendment. It is a comment for the consideration of the one who made the motion.

CHAIRMAN CAHILL: Any other discussion on the motion? The question has been called for. All those in favor of holding the 1959 annual Reciprocal Meat Conference on a university campus signify by saying aye; opposed the same sign. Carried by unanimous decision. You have created that situation. May I call on Charlie Adams, Don Naumann, Homer Smith and Bill Kramlich to assist with this balloting.

Miss Fritz, our secretary who ran the letter that was mailed out to you two or three weeks ago, ran some extra copies, so that we could pass them out here today if they were needed, and you could have the invitations before you.

It is only fair to the new Executive Committee and the conference that if we are going to go somewhere else we decide where, and that as the purpose of the earlier correspondence, the announcement yesterday morning, and the discussion in the afternoon.

If everybody has the sheet in his hand I should like to make two additions to it. Is everyone supplied with the yellow sheet, the copy of a letter which lists the institutions that have extended invitations, and will you please add to that two that we have received since, from Ontario and the University of Missouri.

Now, if you will make up your minds as to your first preference, your second preference, and your third preference, and for ballots we suggest that you just use the top of the letter. Tear off a piece and write on it.

If you have one, two or three preferences this is what it is going to mean in the tally. Your first preference will be given three points, your second preference two points, and your third preference one point. You see, we have statisticians in our group too. Then we will come back with the names of the institutions that have scored high and give you a chance to vote finally for the location of the conference from that list.

(Balloting on 1959 meeting place.)

CHAIRMAN CAHILL: I presume that the ballots are all in, and the tellers will retire.

I wonder now if we may have your attention and we shall move to the so-called reports.

First may we call on the Resolutions Committee which was chairmaned by T. N. Blumer, of North Carolina State College and assisted by W. J. Loeffel, C. L. Strong, R. E. Rust and Roy Snyder. Mr. Blumer, will you present the resolutions at this time?

MR. BLUMER: First I should like to thank the committee. They were all on hand with the exception of Bill Loeffel.

With your permission, I will omit as much of the extraneous material as possible and go ahead with the meat of the resolutions:

I

"Be it resolved that all persons participating and attending the Eleventh Annual Reciprocal Meat Conference do hereby express their appreciation to the National Live Stock and Meat Board for providing the following facilities and services:

1. For the interest and fine cooperation extended to the entire Reciprocal Meat Conference by the Secretary and General Manager, Mr. Carl Neumann.
2. Providing facilities, financial aid and assisting in the development and promotion of the 1958 conference program.
3. Arranging with the management of the Morrison Hotel for rooms and other conference requirements.
4. Furnishing secretarial assistance for the registration of conference participants.
5. For the advice, services and moral support of Mr. Ken Franklin without whose assistance this undertaking would be extremely difficult.
6. Providing for a very delicious banquet and banquet program.

II

"Be it resolved that all persons in attendance wish to express their appreciation for the fine efforts of the Conference Chairman, the Executive Committee, the Program Committee, the Committee Chairmen, and all guest participants.

III

"Further be it resolved that we acknowledge the efforts of Mr. George Wilson and the American Meat Institute Foundation staff for formulating and participating in the Short Course program and providing facilities for the lecture sessions.

IV

"Be it resolved that we as a group wish to thank Mr. George Tupper and the Russell Harrington Cutlery Company for the cultery exhibit and favors.

V

"Finally, be it resolved to express our appreciation to the administrative officers of our various institutions for their interest and support."

I will entertain any other resolutions which you may want to add to these.

I should like to move then that these resolutions be accepted.

(The motion was seconded by several members.)

CHAIRMAN CAHILL: It has been moved and seconded that these resolutions be adopted by the 1958 conference. Any discussion or additions? All those in favor signify by saying aye; contrary the same sign. The resolutions are adopted as read.

While the conference is on this serious note may I continue it for a moment. First I should like to extend thanks to my associates on the Executive Committee and to Secretary Ken Franklin. They were a most agreeable group with which to work. We are also grateful to the committee chairmen who responded so well in developing and following through with their reports. We have experienced firsthand the excellent manner in which the program participants have performed. Their subjects to my knowledge were well developed.

Finally, the willing spirit of cooperation and support of your friends have made this a very pleasant experience for me. I trust that we have not disappointed you in the past year's activities.

As we move along in this business I think that we ought to do a little checking up in the form of the Treasurer's report.

SECRETARY-TREASURER FRANKLIN: Gentlemen, I am happy to report that our treasury over the year increased 300 per cent. You will recall that last year we had $14.10. We now have $44.38. There were no calls on the treasury during the year. However, we do have a bill outstanding for the Chairman's gavel which will probably reduce this to something in the neighborhood of $30.

At this time I should like to ask if any money was spent which sould be accounted for by the treasury. To the best of my knowledge no memorials were sent in the name of the Conference or any other expenditures that weren't handled either by your various departments or out of your own pockets. Knowing the extent of our treasury you may submit your bills for anything that you can think of.

If I may inject a comment, since you have passed membership dues starting with next year, you can anticipate a slight increase in your treasury balance. It has been suggested, and I think entirely appropriately, that inasmuch for the past few years we have awarded our Conference Chairmen appropriate inscribed gavels, perhaps we should reach back into the past and make that gesture retroactive to those chairmen who did not receive gavels.

I think that is an excellent idea and I will so move.

MR. KING: I will second it.

SECRETARY-TREASURER FRANKLIN: That concludes the Treasurer's report.

CHAIRMAN CAHILL: In the absence of funds, it has been moved and seconded that the presentation of gavels to the chairmen be made retroactive throughout the history of the conference. Is there discussion? The question has been called for. All those in favor signify by the usual sign of aye; contrary. The motion is passed.

Is there any other unfinished business that you members would like to bring before the conference? If not, I think we might move into the realm of new business, and I think we should like to hear from George Wilson, if he is prepared.

(Mr. Wilson made announcements regarding the short course.)

CHAIRMAN CAHILL: Thank you, George. The critical announcement I think is 8:15 tomorrow morning at the Clark Street entrance of this hotel.

Any other business to be brought before the conference?

Our tellers are ready to report; so we shall make that the next item of business.

MR. NAUMANN: We will report the top five for you to choose from, they being listed in alphabetical order. Figure that out. Illinois, Michigan, Missouri, Tennessee and Texas A. and M.

CHAIRMAN CAHILL: You have before you the five institutions that have rated the greatest number of points in your initial balloting. May we now suggest that you use another section of the yellow sheet and indicate on that your preference for the location of the meeting next year.

MR. DEATHERAGE: Is it out of order to ask how the vote came out on that? I mean it might help us to get a decision on this ballot.

MR. ADAMS: I don't see why it should influence you.

CHAIRMAN CAHILL: You are casting your vote for your one and only preference now, and the greatest number of votes cast for any one institution will be the decision. Any questions?

MR. WYTHE: How many votes per institution on this?

CHAIRMAN CAHILL: Five votes per institution unless there is some question about it.

MR. AUNAN: Does that mean I can enter three more for Minnesota?

CHAIRMAN CAHILL: Woodie, if there is any feeling that we should change, the conference is open for it.

MR. AUNAN: We will get it next year.

(Balloting on 1959 meeting place.)

CHAIRMAN CAHILL: The votes are in. While the tellers are making this final tally is there any other new business to come before the conference?

MR. LOUIS FEINSTEIN: Going back to an earlier question, are we alternating or are we not?

CHAIRMAN CAHILL: That is a question that probably should be brought up and decided. The question is are we alternating between Chicago and outside institutions or what is the will of the conference? We need to make a decision I think, so that it is understood by the Board and also the American Meat Institute Foundation so that they may have some system for their planning.

MR. KASTELIC: Mr. Chairman, we will be without any experience as to how this will function going outside of Chicago. Why don't we allow the conference to go to a campus and at next year's meeting, when we have had some experience, decide whether or not to come back to Chicago? I think your question projects into a situation in the future and we cannot now answer it.

CHAIRMAN CAHILL: Thank you, Joe.

MR. MULLINS: Mr. Chairman, in order to have a little better future planning, it has already been voted that we move out of Chicago for next year, but I move that we meet back in Chicago in 1960 and that we have the short course the year that we meet in Chicago and omit it at the institution.

MR. KEAN: Second.

CHAIRMAN CAHILL: It has been moved that the 1960 conference be held in Chicago and that the short course be included which will be omitted next year. You are referring to the AMIF short course. It has been seconded by Glenn Kean of Pennsylvania. Any discussion on the motion?

MR. BRATZLER: I think maybe the short course on the campus wouldn't have to be for two days and it could be a shorter short course, and I don't think that we should decide now that no short course will be held next year.

CHAIRMAN CAHILL: May I make one comment, Professor Bratzler? The motion is that the American Meat Institute short course be omitted, which I presume leaves it open if the institution or the conference desires to hold another type of short course by any other name.

MR. SULZBACHER: Vern, are you putting those words into the motion? I don't think it was stated that way.

MR. MULLINS: I did not specify. When I made the motion I did have that in mind. In the back of my mind that is what I intended because that is the only type of short course we have had.

CHAIRMAN CAHILL: All right, I will retract it.

MR. MULLINS: I think, under the conditions of the short course, every other year would be often enough for the short course in my opinion. If it is not the opinion of the conference, then certainly we should find out.

CHAIRMAN CAHILL: Then this is a double question motion that we shall meet back in Chicago in 1960 and we will not have a short course in 1959. Does the second still hold?

MR. KEAN: Yes.

CHAIRMAN CAHILL: The question has been called for. All those in favor signify by raising their right hands; opposed the same sign. Will you help to count them, Mr. Secretary?

Some folks got tired and took their hands down. We will re-vote. All those in favor of holding the 1960 conference in Chicago and omitting the short course in 1959 vote by raising their right hands. Between 22 and 23, an average of 22½. All those opposed to this motion. The motion is lost.

MR. SULZBACHER: Mr. Chairman, I move that the 1960 conference be held in Chicago and that the presentation of a short course be left to the option of the host institution in all years.

(The motion was seconded by several members.)

CHAIRMAN CAHILL: You have heard the motion. The question has been called for. All those in favor of holding the 1960 conference in Chicago and leaving the holding of a short course to the discretion of the host institution. Discussion, please. Has it been seconded?

CHAIRMAN CAHILL: Seconded and the question was called for, but we won't put the question if you want to discuss it.

MR. MULLINS: Is that going to be in collaboration with the Executive Committee or strictly up to the host institution?

MR. SULZBACHER: I would imagine that the host institution would have to consult the Executive Committee when they made their plans.

MR. MULLINS: The motion does not so state and I think it should take that into consideration.

MR. SULZBACHER: All right, I will so amend the motion and state that the short course shall be held at the discretion of the host institution and after due consultation with the Executive Committee and other committees which may be interested.

CHAIRMAN CAHILL: You have heard the amendment to the motion.

MR. KING: I will second that.

CHAIRMAN CAHILL: Mr. King has seconded the amendment. Any discussion on the amendment? The question has been called for. All those in favor of the amendment as stated signify by saying aye; opposed the same sign. The amendment is passed.

Any discussion on the motion carrying this amendment? The question, all those in favor of the motion as amended -- does anyone wish it to be restated -- signify by saying aye; opposed the same sign. The motion is carried. Any other new business to bring up at this time?

MR. WELLINGTON: At the danger of making this a bit more complicated perhaps, I do think it would be very helpful to the host institution and to the Executive Committee if the wishes of the conference were recorded regarding the arrangements which may or may not be made for wives and children. I anticipate that moving to a campus there are likely going to be requests, certainly individuals who are likely going to wish to bring their families with them. As I have worked on some similar arrangements having the experience of making the arrangements for wives and children is one of the major tasks. I don't know that I have any feeling one way or the other, but I think it would be quite helpful to the people planning the conference if they had some expression of the feeling of the conference.

CHAIRMAN CAHILL: I believe that is a very worthy suggestion for consideration. Is there any reaction?

MR. KASTELIC: Mr. Chairman, at the risk of offending Tennessee, I would like to suggest that we not let the selection of a place for the meeting on campus degenerate into a popularity contest. I think there is some reason to consider the possibility of having the conferences held in geographic areas. I should like to suggest that the Executive Committee proceed to divide the United States into four or five areas, and that when we vote subsequently to go to other campuses the voting be restricted to the institutions within each area. If this is followed I think we can have the conferences in various parts of the United States. If we handle it on the basis of a popularity contest, it might be 20 years before we get to Arizona. (Laughter)

MR. HENRICKSON: I just wonder if provisions have been made to invite Mr. Tupper to the university next year, and if arrangements have been made to carry his boxes for him.

MR. PIERCE, JR.: I am a little further along on Mr. Kastelic's suggestion and I am highly in favor of such a suggestion. I move that the suggestion be submitted to the Executive Committee for their consideration and that this question be brought to a vote at the conference next summer.

MR. NAUMANN: I second the motion.

CHAIRMAN CAHILL: You have heard the motion and second. All those in favor of the motion as stated signify by saying aye; opposed. The motion is carried.

My associates have informed me of a situation that has arisen. Ninety-four votes were cast for the location of the meeting next year. Sixty-nine of them were divided between two institutions with a nine-vote spread between the two. Their good judgment is do you folks want to consider a vote now between the two or do you wish to take it as it stands? Perhaps if we had a motion one way or the other--

MR. KEAN: Mr. Chairman, I make a motion that we take the report as it stands.

MR. DEANS: I second the motion.

CHAIRMAN CAHILL: The motion has been made and seconded that we take the vote as it stands. All those in favor signify by saying aye; opposed the same sign. The motion is carried.

Mr. Chairman, do you want to indicate to us the result of the vote?

MR. NAUMANN: Yes, we are going to Michigan. (Applause)

MR. BRATZLER: Mr. Chairman, on behalf of the ones who are going to do the work (laughter), I want to express our appreciation for your confidence. We will do our best, and in one way I can say this now that there isn't another institution -- we are not going to set a standard as far as the social activities go. Too many of these conferences develop into so-called rat races. "Well, Michigan did so and so last year; we will have to do a little better this year." Of course, you know what that finally involves. We are going to put the emphasis on the programs that we have had here, and we will take into consideration families who may come along, but if you are coming with the expectation of a high, wide and wild time, you may be disappointed. We are going to think first about the conference and social activities secondly.

Thank you. (Applause)

CHAIRMAN CAHILL: I believe, Mr. Bratzler, it would be helpful if we established a time or a week for this meeting next year, or how do you care to handle that?

The reason I raise the question is we would not meet during the same week that the Board is holding its meeting here in Chicago for very obvious reasons.

MR. BRATZLER: As I remember, in checking with the Kellogg Center of Continued Education, there was one week that was not possible, and I would not want to say definitely here today until I check on Friday.

MR. MACKINTOSH: Except the week of June 23.

MR. BRATZLER: Well, you know, Davie, the department wrote our letter just like Weber wrote the one from Kansas and I want to check. I am not saying anything about the dean, but I want to check for certain. As far as I know now the week that was mentioned is not okay.

CHAIRMAN CAHILL: The week of the 23rd would be the week following our meeting normally which may not be available at Michigan State and their facilities. Would you want an expression of this group concerning the following week, which would be June 29, Monday and Tuesday, with 4th of July on Saturday the following week? Or do you want to leave it open?

Any other new business to come before this group?

MR. SULZBACHER: A question before we finish this meeting. Why do we have to meet in June?

SECRETARY-TREASURER FRANKLIN: In answer to that, the main reason we have met in June up to this point is to concur with the Board's annual meeting.

MR. SULZBACHER: Yes, I understand that.

SECRETARY-TREASURER FRANKLIN: There is next year no pertinent reason that I can see.

MR. SULZBACHER: Then why wouldn't it be sensible for Lyman to consider the situation at Michigan and send a letter in a week or so to what would be the most sensible date for him?

CHAIRMAN CAHILL: The consensus of opinion from the floor seems to be that the host institution and the Executive Committee should make this decision.

MR. MACKINTOSH: Mr. Chairman, ten years ago is a long time I know, but ten years ago when June was selected as the date for the reason that has been mentioned there was a considerable caucus of all those involved. That number was very small compared to that of today, but at that time June was the most sensible month. I say, ten years was a long time ago.

MR. KASTELIC: There is another point to be raised here. If you are meeting on a campus and if you have the parking problem we have at Illinois, I would not meet during the school semesters.

CHAIRMAN CAHILL: There are many things to consider. I think there is an announcement concerning the banquet tonight.

(Announcement.)

CHAIRMAN CAHILL: Now may I turn this meeting over to our new Chairman, C. H. Adams of Nebraska, and let him carry on from here and adjourn the conference?

(Mr. C. H. Adams assumed the chair as Chairman. Applause)

CHAIRMAN ADAMS: I want to thank you members of the conference for the confidence that you have placed in me.

I think that right now is a very excellent time for us to give our past Chairman a good hand for the fine work that he has done on this conference. (Applause)

Now I think that it is time for the applause that is also due Ken Franklin for all the leg work that he has done in getting this conference organized and set up. (Applause)

Now that we have had our exercise in applauding there are a few things that I would like to bring to your attention. First of all, George Wilson, do you have an announcement or have you made an announcement about the short course for tomorrow? It has been done. Thank you, sir. What time is it and where? I want to go.

MR. WILSON: Eight-fifteen.

MR. CAHILL: The Clark Street entrance.

CHAIRMAN ADAMS: The Clark Street entrance, fine.

Now there is one very short notice that I should like to give at this time.

First of all, if you are not satisfied with the committee on which you are serving, please notify us as soon as possible so that we can change our schedule of committee assignments. If there are any committee chairmen who wish to turn their chairmanship over to someone else on the committee, please let that be known to us, because we must get the committees organized and going as soon as possible.

For clarification, in writing to me please write to me at the Animal Husbandry Department at Michigan State University until August 19. Any correspondence after that time please send to the University of Nebraska, so that we will not be all mixed up on material that is being mailed back and forth.

All right, I am acting now without the authority of our new Executive Committee but I think now is the time to announce the recommended suggestion of collection of annual membership dues. Remember that we have voted for active memberships $2 per year. We should like to start this on a calendar year basis. The $2 active membership dues are due on January 1, 1959. Any time between now and then please send them to our Membership Committee chairman. He is Mr. R. J. Deans, Michigan State University, East Lansing. He will be collecting the dues.

Associate members' dues are $1 and are also due on the first of January. If you attended in 1957 and this year, you are automatically an associate member. To be active members you must have attended in 1956, 1957 and this year. If you do not fall into either of those two categories you must submit an application, according to the recommended procedure stating the amount of time that you are spending in meats work and the department in which you belong, with a conference member as a cosigner. That is all. Make sure that you get those applications in and our committee will act on them as soon as possible.

Are there any other announcements that should be made?

MR. HAVENER: I don't have an announcement. I am wondering about this policy for the payment of dues. It seems awfully complicated for Bob Deans and I am not sure that he wants this to be scattered out over the year.

MR. DEANS: Just be sure to put the money into the mail and I won't mind.

MR. HAVENER: I wonder if it would not be possible to pay when we pay for our short course here in Chicago.

CHAIRMAN ADAMS: That will be possible this coming year, but you must remember that the primary purpose is to set up our mailing system, and if we wait until next June, or our next conference meeting, we still won't know who the members are. That is the reason we are setting the January 1 deadline. In other words, we are going to know six months ahead who the members of this conference are. Membership cards will be printed and sent to you, and it will be handled in that way.

I should like to have a meeting of the Executive Committee immediately following the banquet tonight in room 620.

Are there any other comments?

If not, the meeting is adjourned and we will meet at the conference next year.

(The conference adjourned at 5:15 o'clock.)

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Sausage manufacture.
Packing industry: Organization and operation.

Livestock marketing and livestock loss prevention.
Merchandising, wholesale w/methods of distribution.

Merchandising, retail and frozen food lockers.
Meat pricing.

Meat consumption, factors influencing; areas of production.
Care of meat in the home, cooking and carving.

Principles of refrigeration and cold storage.
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Canned Meats
Flavor theories
Dark cutting beef
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